

AXIS



ME-11 METER

Engineering documentation

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1. General information

ME-11 meter is a component assigned to build 1- or 2-range scales using extensometer force sensors. Meter is equipped with a set of numerical keys designed to facilitate inscribing numerical data : tare value, threshold values and identification data (product ID, operator ID etc.).

ME-11 can be used as optional meter in platform and industrial scales BA and 4BA produced by AXIS.

Each meter has the set of special functions: automatic zeroing, pieces counting, comparing with threshold values, etc., which may be available for the user or not – according to the order.

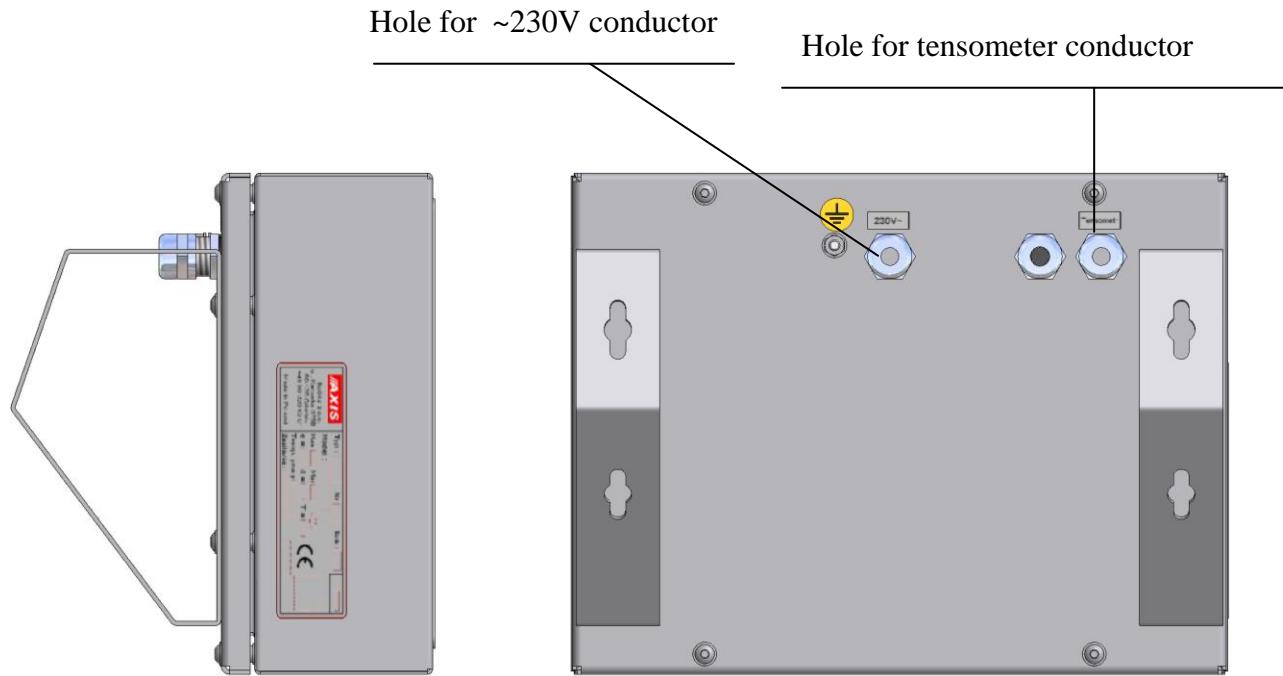
2. Completeness

A standard set consists of:

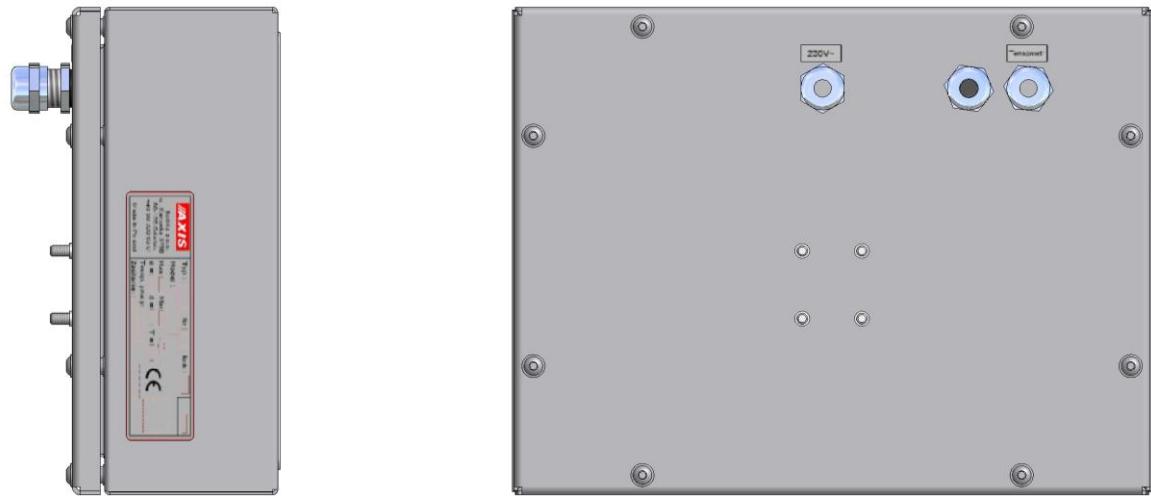
1. ME-11 meter
2. Engineering documentation
3. Mounting manual (on demand)

3. Meter main view

Basic version (cable):



Column version :



4. Keys and indicators



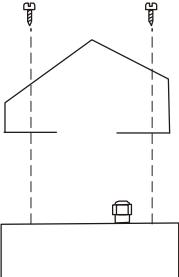
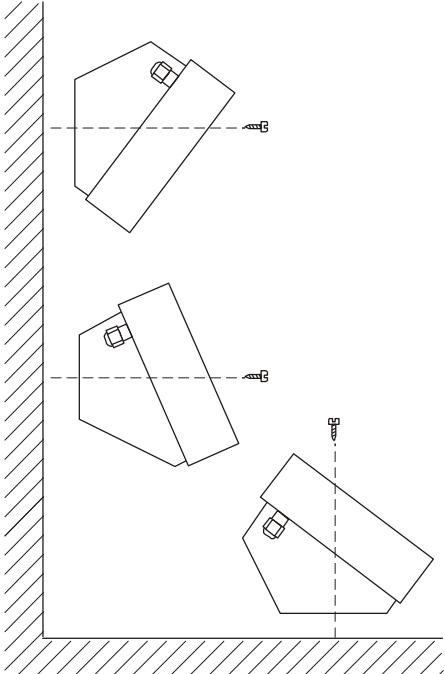
key	I/∅	- switch-on / switch-off (standby),
key	→T←	- tare (subtract package weight from weighed mass),
key	→0←	- zeroing (when the platform is empty),
key	□	- result printout,
key	Program	- programming (program recall),
key	0, 1, 2, .., 9, .	- numeric keys,
key	A, B, ... , F	- batching devices keys, A – mode change of active special function B – gross/net mas switch C – inserting product and operator codes (Print function) D – additional digit displaying
key	Enter	- confirm (enter data)
key	Clr	- reverse the last programming operation / instant batching break
key	Start	- start dosing,
indicator	→0←	- zero indicator,
indicator	---	- result stabilisation indicator,
indicator	NET	- net weight indicator (indication with subtracted tare)
indicator	READY	- the device is ready for weighing, batching or programming,
indicator	END	- batching end indicator
indicator	MODE	- special function active,
bar indicator		- total load indicator (graduated 0-100%)

5. Technical data

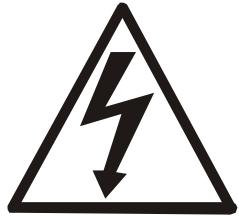
Parameter	ME-11
Destination	to II class scales one, two and three-ranged with verification units number $n \leq 6000$ and to III class scales one, two and three-ranged with verification units number $n \leq 3000$
Max verification units number	6000
Internal resolution	1:16 777 216
Power supply	AC: 230V 50Hz DC: 12V or accumulator 6V ÷ 12 V
Keyboard	25 keys
Display	LCD (alphanumeric)
Transducer supply voltage	5V or 5V keying (choper)
Voltage measurement range	-10 mV ÷ 10 mV or 0 mV ÷ 10 mV
Maximal voltage signal for stable loading	+ 10 mV
Minimal voltage signal for stable loading	- 10 mV or 0 mV
Minimal allowable input signal corresponding to verification unit e	0,3 μ V
Sensor impedance range	40÷4000 Ω
Work temperature range	- 10 °C ÷ +40 °C
Part of limiting error	0,5
Sensor connecting	4 or 6 conductor system
Maximal cable length	75 m/mm ²
Primary measurement module functions	<ul style="list-style-type: none"> - gross and net mass indication - automatic and semi-automatic zeroing - semi-automatic tare, - connection with computer (RS232C, RS485, Ethernet, USB, radio) - analogue output - technological process steering - and others
Enclosure type	ODN
Security level	IP65
Dimensions	238x182x77mm

The metrological parameters of the balance are indicated on the rating plate.

6. Assembly

Assembly	ME-11
Meter grip assembly	
3 ways to mount the meter to wall	
Mounting to wall or desktop	2 holes $\Phi 5$, spacing 203mm

7. Security rules



To avoid electrical shock, scale or other connected peripheral devices damage, it is necessary to follow the security rules below.

- To supply the scale use power outlet with protective contact (not for scales with external feeder).
- Repairs and essential scale regulations can be made only by authorized personnel.
- To avoid fire risk use a feeder of an appropriate type (supplied with a scale). Pay attention that supply voltage is compatible with specified technical data.
- Do not use a scale when its cover is opened.
- Do not use a scale in explosive conditions.
- Do not use a scale in high humidity.
- If a scale seems not to operate properly, plug it out of the mains and do not use it until checked by authorized service.

8. Rules proceeding with used up scales



According to obligatory rules concerning environment protection used electronic devices should not be put in a container with normal waste.

- After exploitation used scale should be given to special units authorized to collect used electronic equipment or to the place where the device was bought.

9. Assembly and connecting external devices

1. To build a scale basing on ME-11 indicator contact authorized manufacturer service point or use Installation Guide delivered with the indicator (other brochure).
2. The manufacturer gives a full guaranty for ME-11 indicator only when the indicator was mounted by AXIS Sp. z o.o. In other cases the guaranty obligation is taken over by the final contractor of the weighing device.

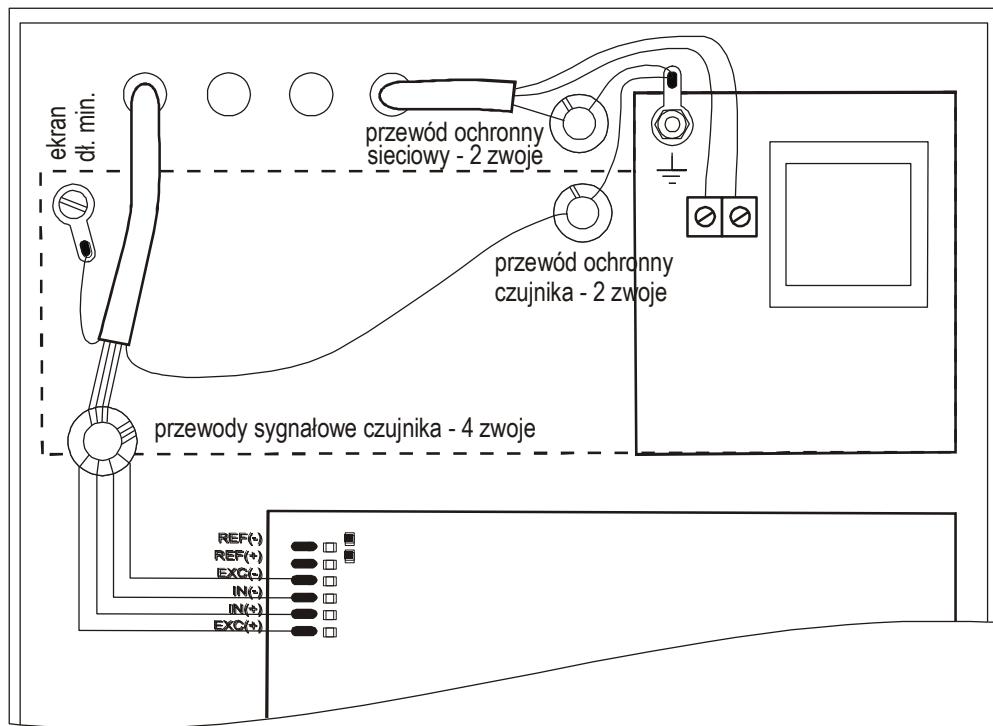


Before connecting the sensors to the indicator unplug the device from the mains to avoid damaging the indicator.

To comply CE marking requirements, for connecting the wires use filtering core $\phi 20\text{mm}$.

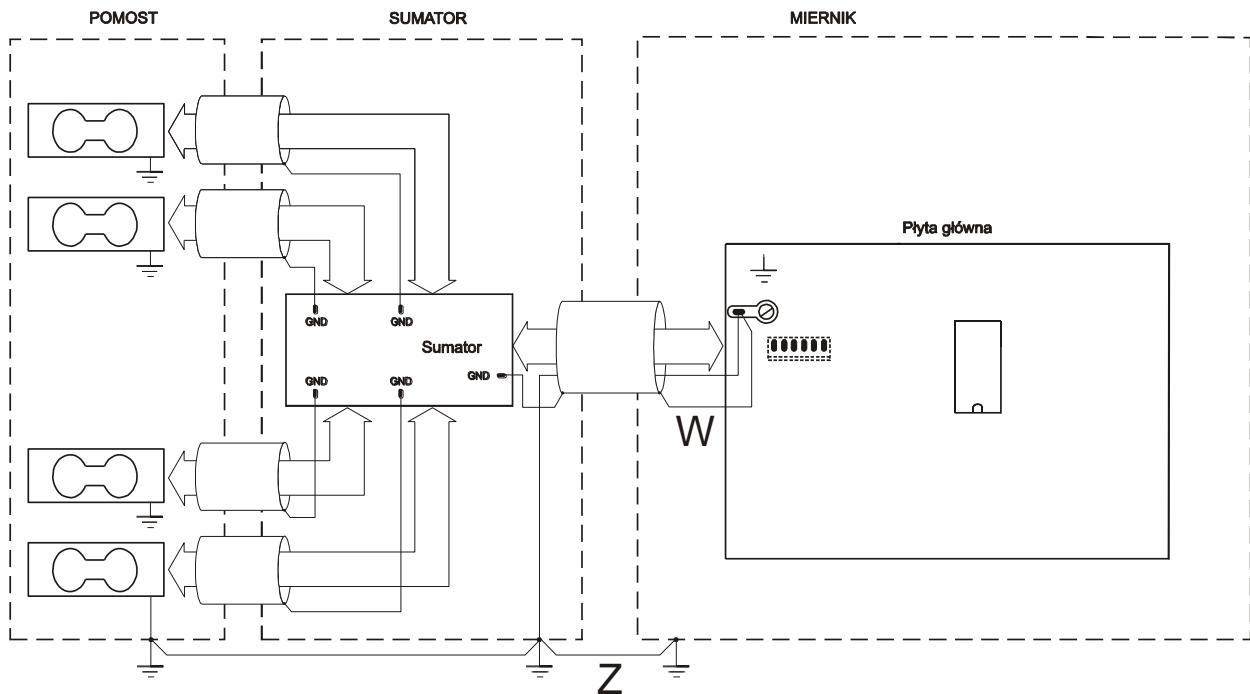
The core should be placed within 30mm from the place of its connection.

Single strain gauge scheme inside ME-11:



When 6-wires connection of strain gauge transducers is used (REF+ and REF- jumpers shown on the picture above should be soldered out from the main board

Diagram of common wires and shields in the platform balances:

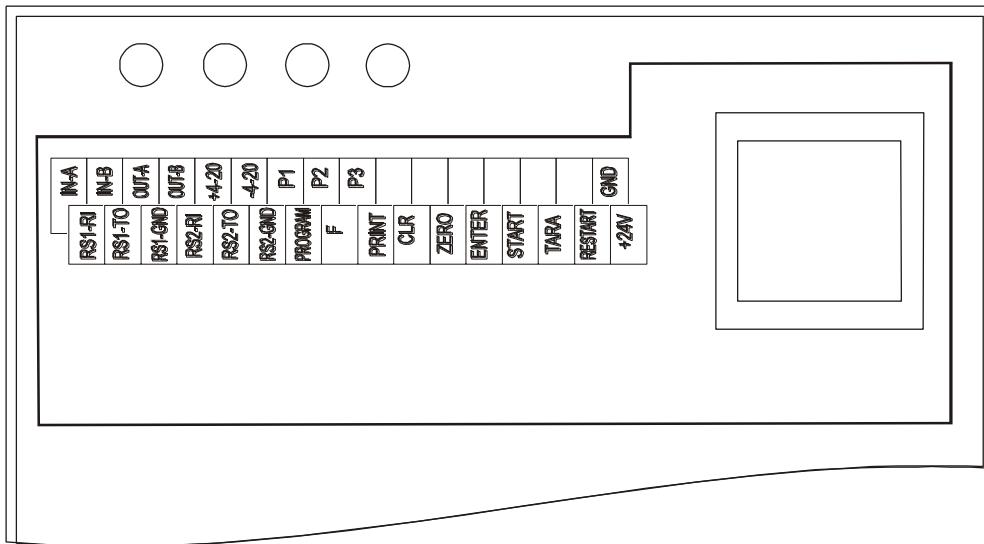


Caution: The galvanic connection of sensors and adder housing is necessary.
In normal conditions grounding is made only by using W conductor.
In conditions of increased electrostatics grounding should be made with additional Z conductor (minimum 2,5 mm²).

Connect conductors from external devices to meter sockets, led out wires or to bar on supply board inside the meter (option). During leading out wires from meter housing use hermetic culverts in housing.



All devices connected to the scale should be supplied from the same phase 230V.



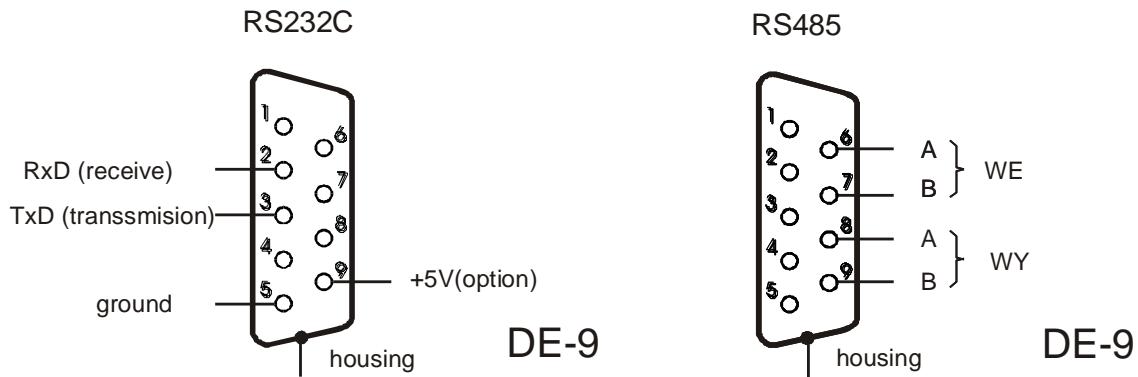
Description (option):

IN-A,IN-B,OUT-A,OUT-B
+4-20; -4-20

P1-P3(PROGI)
GND
RS1 - RI, TO i GND
RS2 - RI, TO i GND
Program, Print (with a small printer icon), F, Clr,
Zero (with a left-right arrow icon), Enter, Start,
Tara (with a left-right arrow icon), Restart
+24V

- RS485 joint,
- analog out 4-20mA (optional 0-10V or 0-20mA)
- transoptor out to transducer,
- External ground (transoptor emitters),
- RS232C main joint (e.g. for computer),
- RS232C additional joint (e.g. for printer),
- external keys in (Restart key doesn't appear on scale's keyboard),
- external transoptors supply IN

9.1 Communication connections

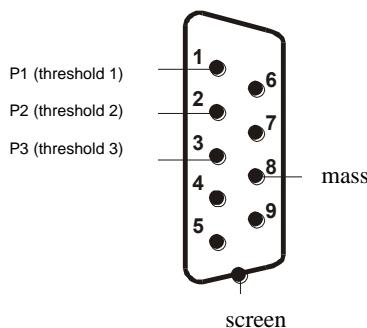


In ME-11/N meter connectors are led out on cable. If RS232 joint is replaced by LAN or USB interface, needed drivers and instructions are on AXIS CD provided together with the meter.

9.2 Transmitter connection

P1-P3 (THRESHOLDS) outputs are used to connect dosing or signalling (option) devices. There are opto-isolators of an open collector type with 50mA / 24V maximum load. They can be connected directly to transmitters inputs or to MS3K/P board offered by AXIS separately or in ST 3K/P control box (3 transmitters, own power supply).

In ME-01/A connection THRESHOLD is placed on indicator's housing. In ME-01/N meter connection is placed on conductor.

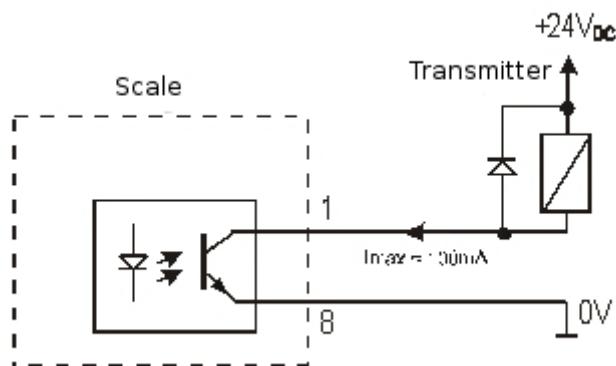


Optional indicators outer wires have digital markers.

Marker No.	Signal	Wire color*
1	P1 (I threshold)	Green
2	P2 (II threshold)	White
3	P3 (zero)	brown
10	GND (indicator ground)	black or yellow

* colors might change

Diagram for direct connect a transmitter to THRESHOLD output:



* in option without an interface – 10 is in the place of 8

Outputs are adapted for direct connection RM96P transmitter of DC24V input voltage and AC250V 8A output. Transmitter's coil has to be secured with diode e.g. 1N4148.

It is recommended to use MS 3K/P electronic board (3 transmitters of RM96P type – max. load of 3A/250V) or complete ST 3K/P control box (feeder, 3 transmitters like above).

The way **THRESHOLD** outputs work is described in the separate document (*Special functions description*).

9.3 External key connection

The input of external keys allows to place (make double) selected scale keys into control box or operator's workstation. As a standard the input is taken out with a wire for direct connect to a control panel.

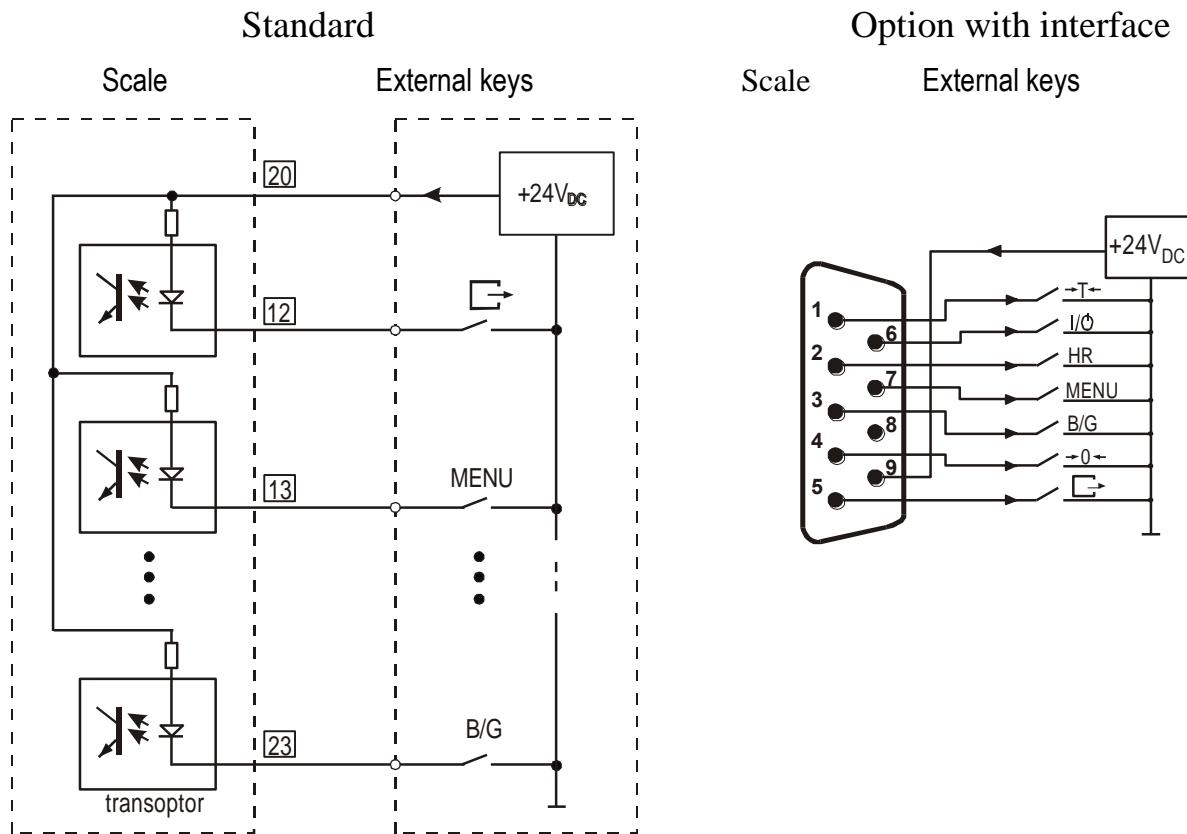
Marker numbers and outer wires colors indicators:

Nr	Signal	Wire color
	External keys input (input)	
11	<i>Program</i>	Green
12		White
13	<i>F</i>	Brown
14	<i>Clr</i>	Yellow
15	$\rightarrow 0 \leftarrow$	Red
16	<i>Enter</i>	Blue
17	<i>Start</i>	Pink
18	$\rightarrow T \leftarrow$	Violet
19	<i>Restart</i>	Black
20	$+24V$	Grey
21		-

* colors might change

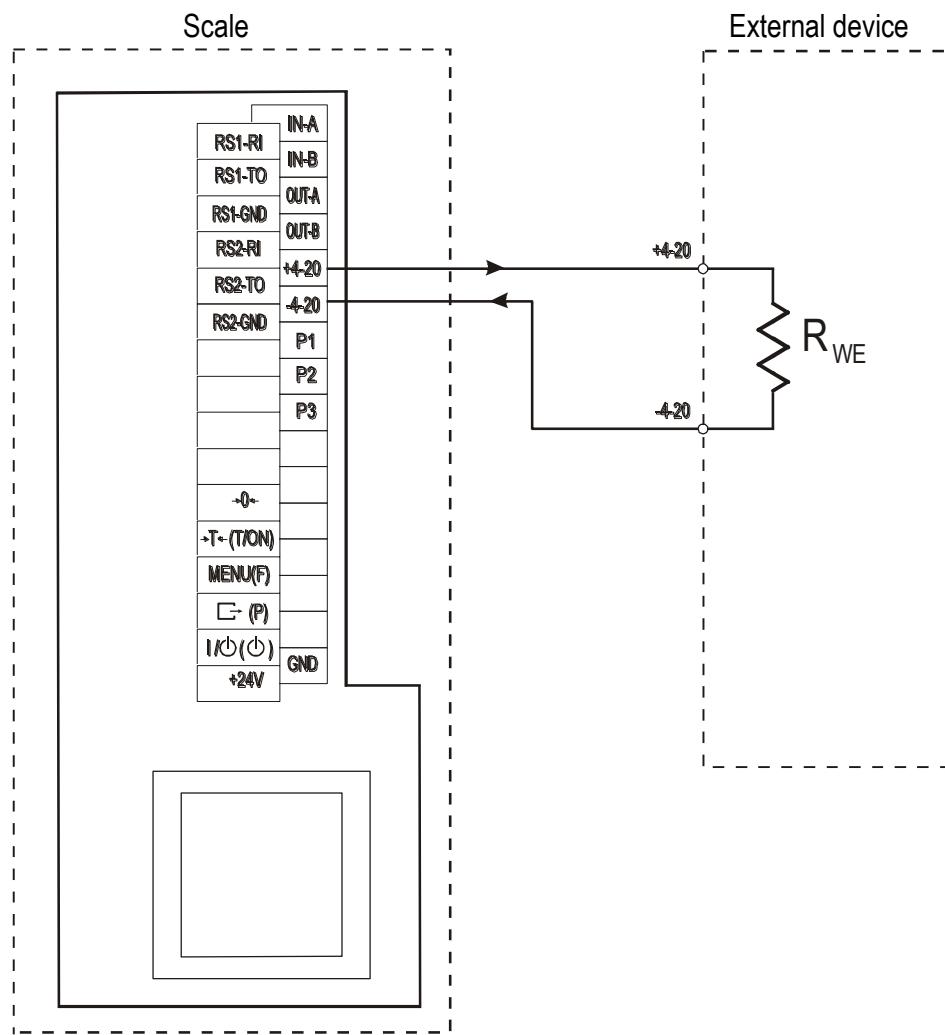
External key connecting is shown below. It is crucial to use external supply (24V) in order to make current flow through scale transoptor input. This way of connection provides galvanic separation of the scale from automatics systems which increases resistance to external interference and increases reliability.

External keys connecting:



9.4 4-20mA connection

Connection scheme for analogue out 4-20mA:



Attention:

1. Connection requires using scale supply (supply from internal accumulators is insufficient, accumulators discharge to fast).
2. A condition must be fulfilled: $R_{WE} < 510\Omega$

10. Operating rules

1. Before each measurement make sure that zero indicator is displayed. If zero indicator does not displayed or “----“ communicate appears, press $\rightarrow 0 \leftarrow$ key and wait until zero indication and zero indicator appears
2. The meter is equipped with tare equal to its measurement range. To tare the scale press $\rightarrow T \leftarrow$ key. In order to make mass control on pan easier and avoiding overflowing measurement range, scales with LCD display have load indicator scaled $0 \div 100\%$.
3. Weight result should be read out while \square indicator is displayed (this indicator means that the measurement is stable).
4. When there is no need to weight and only stand by mode is necessary , the scale can be turned off using I/\emptyset key. This will switch off scale reading out system and turns the scale to readiness state signalized by *OFF* indicator(scales with LCD display). Turning on the scale is made by pressing I/\emptyset key. After autotests the scale is ready to work with full precision.
5. Weighed sample should be placed in the centre of the platform.



Do not drop weighed objects on pan. To avoid this, it is recommended to place the scale on a platform.



Do not overload the balance above 20% of maximal load (Max).

6. The scale should be protected from dust, aggressive pollens and fluids. To clean it, it is advised to use a wet rag with soap and afterwards dry it.



Complete discharging can damage the accumulator.

After discharging indication appears, accumulator should be quickly connected to external power supply. Charging is more efficient when the scale is turned off by I/\emptyset key, charging time takes then about 10 hours.

11. Connection with computer or printer (option)

In order to send data to external devices the scale is equipped with serial interface.

Standard meter is equipped with RS232C interface (transmission parameters: 8 bits, 1 stop bit, no parity, baud rate 9600bps).

The optional interfaces RS485, USB or LAN have different transmission parameters but they use the same way of data protocol (Long). To configure LAN use DS Manager software available on AXIS CD.

The scale sends weighing result when initial signal from computer appears or  key of the scale is pressed.

During cooperation with printer data is sent automatically after a sample is put on and scale indication becomes stable. Next transmission is possible after sample is taken off. Successive measurement number and weighing result (look at setting serial port parameters) are sent.

The way of sending data and transmission parameters are set using special function *SErIAL*.

The set of send data (for each transmission) is set using special function *PrInt*.

Following data can be send:

- Header (scale type, Max, d, e, serial number),
- Operator id number,
- Successive print number (measurement number),
- Identification number or barcode,
- Pieces quantity (*PCS* function),
- Nett weight,
- Tare (package weight),
- Gross weight,
- Total mass (*totAL* function).

If the scale cooperates with a computer, the computer must have a program that enables data processing from scale.

The description of data transmission protocol in standard mode (Long protocol)

Transmission parameters: 8 bits, 1 stop bit, no parity, baud rate 9600bps,

Data exchange method:

- Readout scale indication (equivalent of using  key on scale):

Computer→Scale: **S I CR LF (53h 49h 0Dh 0Ah)** – initialization signal,

Scale→Computer: the scale sends 16 data bytes according to table:

Byte 1	- sign „-“ or space
Byte 2	- space
Byte 3÷4	- digit or space
Byte 5÷ 9	- digit, decimal point or space

Byte 10	- digit
Byte 11	- space
Byte 12	- k, l, c, p, o, m, g, d or space
Byte 13	- g, b, t, c, z, g, r, w or %
Byte 14	- t or space
Byte 15	- CR
Byte 16	- LF

Note:

Inscribing network number different than zero (*SErIAL / nr* function) changes scale working mode: communication with a computer is possible after logging the scale in with 02h scale_number command. To log the scale out use 03h command.

When using joint RS test programme available on [www.axis.pl /en/ programy komputerowe](http://www.axis.pl/en/programy_komputerowe) , for example \$0201 should be inscribed for scale nr 1 and then *SI*, log off: \$03.

- Scale tare (equivalent of using →T← key on scale):
Computer→Scale: **S T CR LF** (53h 54h 0Dh 0Ah),
Scale→Computer: no response,
- Scale zeroing (equivalent of using →0← key on scale):
Computer→Scale: **S Z CR LF** (53h 5Ah 0Dh 0Ah),
Scale→Computer: no response,
- Turn on/off (equivalent of I/O key):
Computer→Scale: **S S CR LF** (53h 53h 0Dh 0Ah),
Scale→Computer: no response,
- MENU displaying (equivalent of *MENU* key):
Computer→Scale: **S F CR LF** (53h 46h 0Dh 0Ah),
Scale→Computer: no response,
- Setting threshold 1 (option):
Computer→Scale: **S L D1...DN CR LF** (53h 4Ch *D1...DN* 0Dh 0Ah)
where: *D1...DN* –threshold values, maximally 8 signs,
Scale→Computer: no response,
- Example:
 - in order to set low threshold 1000g in scale B1.5 (d=0.5g) the following order should be sent:
S L 1 0 0 0 . 0 CR LF (53h 4Ch 31h 30h 30h 30h 2Eh 30h 0Dh 0Ah),
 - in order to set low threshold 100kg in scale B150 (d=50g) the following order should be sent:

S L 1 0 0 . 0 0 CR LF (53h 4Ch 31h 30h 30h 2Eh 30h 30h 0Dh 0Ah),

- Setting threshold value 2 (option):

Computer→Scale: **S H D1...DN CR LF (53h 48h D1...DN 0Dh 0Ah),**

where: $D1...DN$ – threshold value, maximally 8 signs,

Scale→Computer: no response.

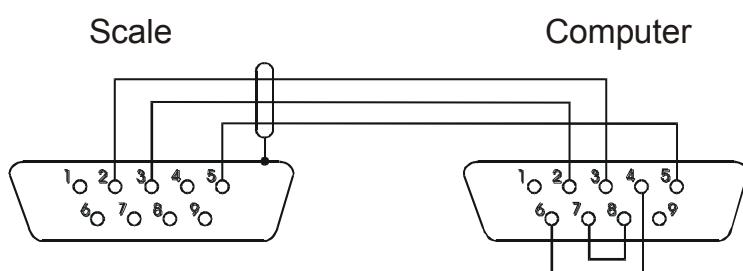
- Setting threshold value 3 - zero (option):

Computer→Scale: **S M D1...DN CR LF (53h 4Dh D1...DN 0Dh 0Ah),**

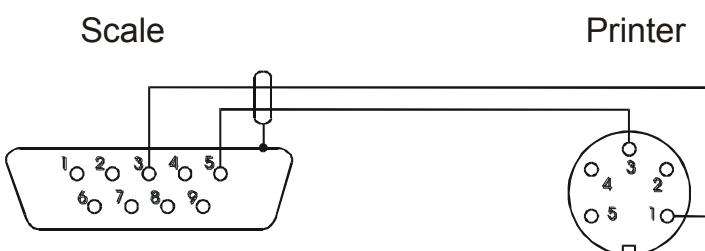
where: $D1...DN$ – threshold value, maximally 8 signs,

Scale→Computer: no response.

Connecting cable WK-1 (scale – computer / 9-pin):



Connecting cable WD-1 (scale – AXIS printer):

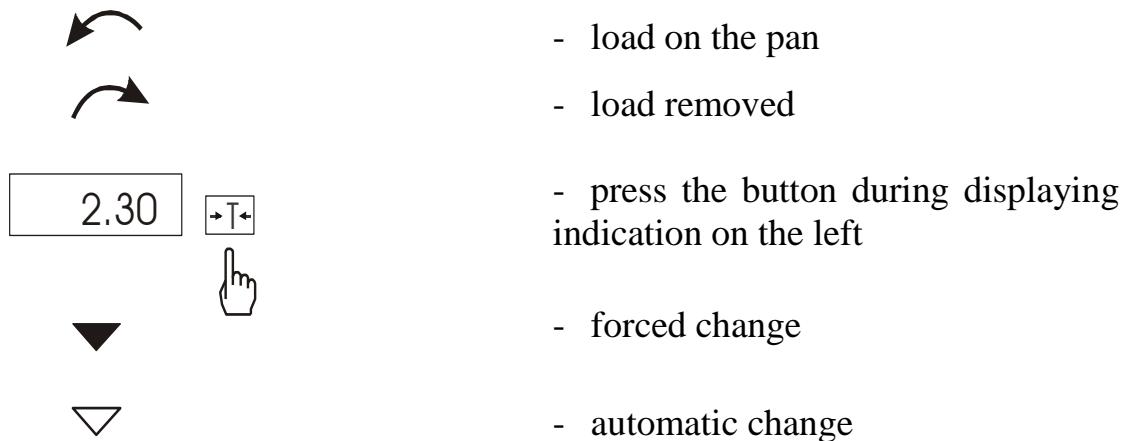


Internal switches settings of AXIS printer:

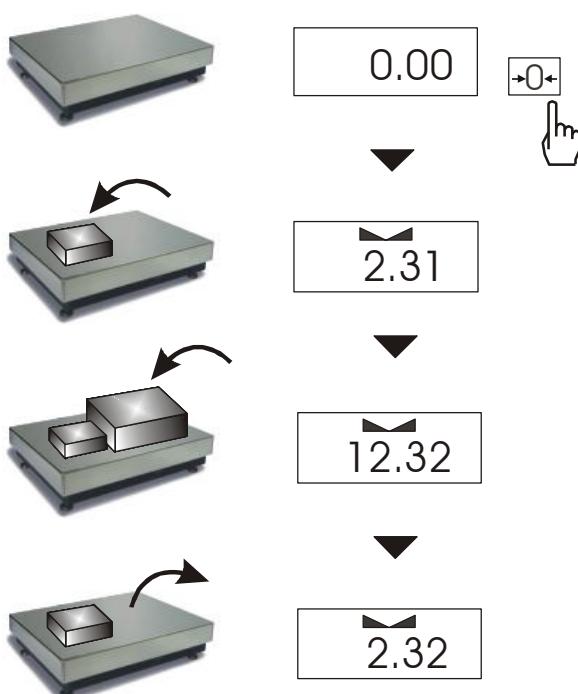
SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	SW-7	SW-8
on	off	on	off	off	on	off	off

12. Basic scale functions

Meaning of graphic symbols used in further instructions:



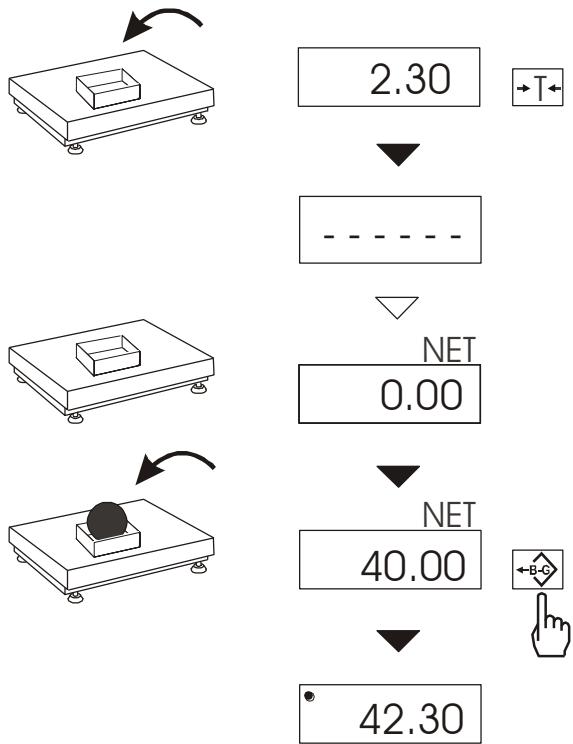
12.1 Common weighing



The $\rightarrow 0\leftarrow$ key operates only with unloaded pan, and zeroes the balance indication.

The weighing result should be read when the " \blacktriangleleft " indicator is on.

12.2 Weighing with tare



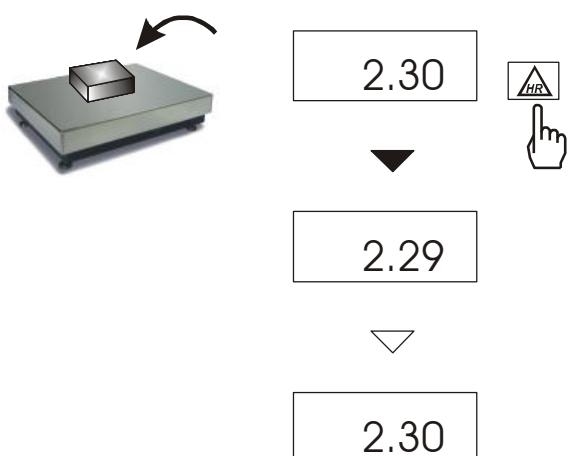
The balance enables tare setting in the whole measuring range.

The B button allows for reading gross weight.

Caution:

Repressing the B button switches the scale to the net weight display.

12.3 Balance resolution increasing



The D button causes the momentary result displaying (approx. 5 seconds) with the maximum resolution, allowed by the balance processor. That button is especially useful in the legalized balances with d=e reading graduation.

The increased resolution result is the auxiliary information, and may not be printed or sent to the computer with the **EN** button.

13. Special functions

Besides basic functions scale have a set of special functions:

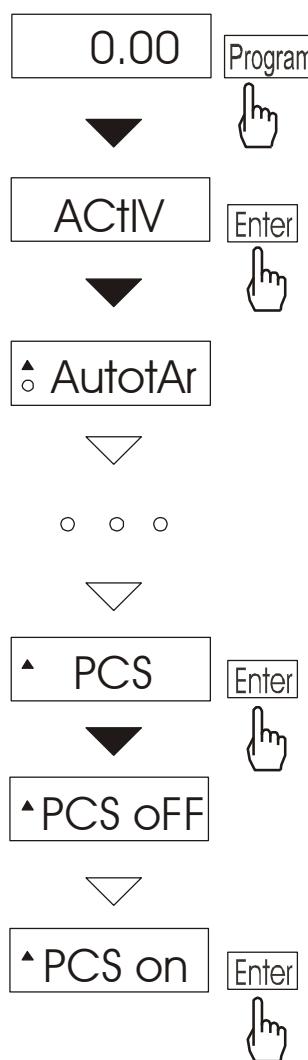
- menu customization function (*ACtIV*),
- removal of all function from menu (*dEFAUL*).
- autozeroing function (*AutotZEr*),
- pieces counting function (*PCS*),
- change of mass unit (*UnIt*),
- percentage weighing function (*PErCEnt*),
- recipe weighing function (*rECIPE*),
- extended calibration function (*CALlbr*),
- selecting label number function (*LabEL*),
- function for setting serial port working (*PrInt*),
- function for setting serial port (*SErIAL*),
- weighing large animals function (*LOC*),
- entering tare function (*tArE*),
- maximum value indication function (*UP*)
- force measuring function (*nEWton*)
- anti-disturbance filter function (*FILTEr*)
- entering reference zero (*ZErO*)
- setting backlight (*b-LIGHt*)
- statistical calculations (*StAt*)
- paperweight calculation function (*PAPER*)
- main mass unit change (*lb_bAL*) - *option*

and functions that require additional equipment to be completely functional:

- option with accumulator supply:
 - Setting accumulators charging (*bAttErY*)
 - Automatic switching off scale function (*AutoOFF*)
- options with the clock:
 - setting current date and time function (*dAtE*)
 - total weight function (*total*)
- options with the transoptors connectors:
 - checkweighing function (*thr*)
- option with *USB*:
 - function for setting additional serial port (*SErIAL/Port-2*)
- option with radio connection:
 - function of choosing communication channel (*rF Chn*)

User create own menu by choosing function in *ACtIV* function (described in chapter 14.1).

13.1. Customization of special functions menu (*ACtIV* and *dEFAULt*)



The function allows choosing among available special functions these, which will be displayed after pressing *Program* key. It helps to avoid displaying all available functions, what can make operation time longer.

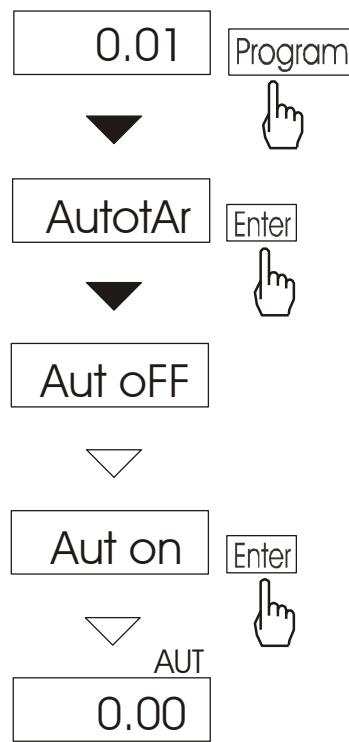
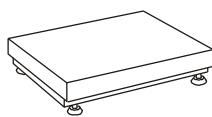
To distinguish *ACtIV* function from function menu list, ▼ indicator is displayed on the left side.

In every moment it is possible to restore primary (manufacture) settings choosing *dEFAULt* special function.

The example on the left shows the operations of adding function for setting parameters of serial interface to function menu.

In order to remove a function from menu, choose *PCS oFF* in place of *PCS on* in the last step of the example.

13.2. Autozeroing function (AutotAr)



Switching the function on causes zero indication is automatically maintained when there is no load on the pan or zero indication was received by pressing $\rightarrow T\leftarrow$ key.

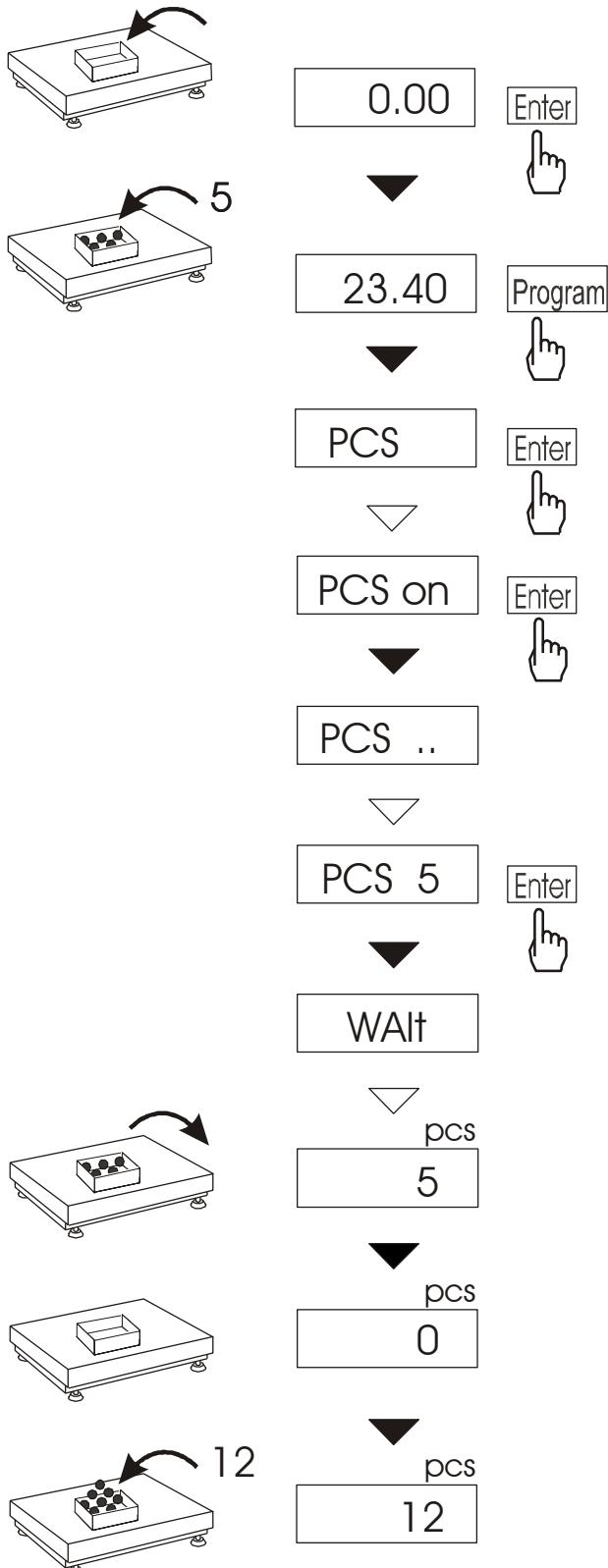
To switch the function on press *MENU* key and then using $\rightarrow T\leftarrow$ key choose *AutotA*, and then *Aut on*.

To switch the function off press *MENU* key and then using $\rightarrow T\leftarrow$ key choose *AutotAr* and *AUT OFF*.

Note:

1. *AUT* sign occurs only in scales with LCD display.
2. In scales with $\rightarrow 0\leftarrow$ key active function changes name into *AutoZE* (autozeroing) and works only when the scales is unbiased.

13.3. Pieces counting function (PCS)



This function enables to count identical pieces, e.g. turnbuckles or buttons.

A measurement is performed in two phases:

- first phase - single piece weight calculation on the basis of defined pieces amount (5, 10, 20, 50, 100, 200 or 500 pieces),
- second phase – pieces counting.

First phase options:

- **PCS ..** – recalling of a value inserted earlier (this quantity must be inscribed earlier),
- **PCS SET** – set any amount of pieces in a sample,
- **PCS uM** – set unitary mass directly,
- **PCS rS** – inserting number of details in a sample and receiving of their mass from other scale connected by RS-232C.

It is advised that single piece weight is not less than one reading unit and sample weight used in first phase is bigger than 100 reading units.

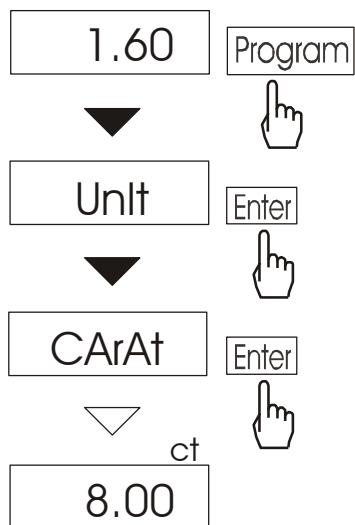
To leave function press **MENU** key and then with $\rightarrow T \leftarrow$ key chose **PCS** and **PCS oFF**.

Note:

1. **PCS Err** communicate signalises that a sample was not put on the pan or if single piece weight is less than one reading unit (it is possible to count pieces but measuring error is bigger).

4. In scales equipped with LCD display, weighing unit is visible and "□" sign is replaced with "pcs".

13.4. Function for changing mass unit (Unit)



The function allows selecting weighing unit:

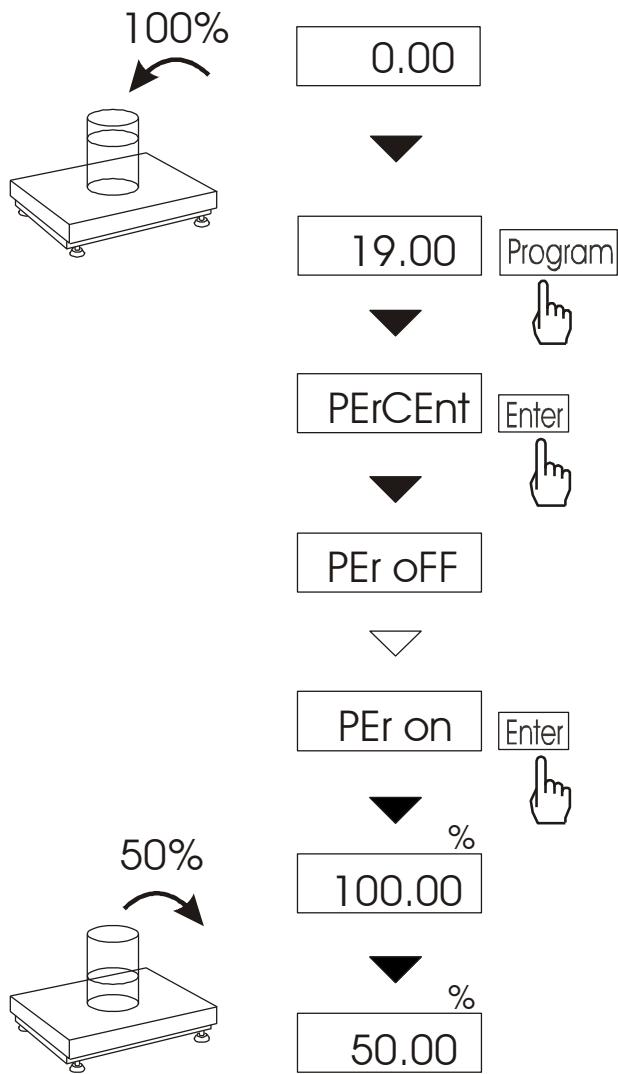
- CarAt (1 ct= 0,2 g) - carat,
- MGrAM (1mg=0,001g) milligram,
- KGrAM (1kg=1000g) kilogram,
- Pound (1 lb=453,592374g) English pound,
- OunCE (1oz=28,349523g) - ounce,
- OunCEt(1ozt=31,1034763g) pharmaceutical ounce,
- GrAIn (1gr=0,06479891g) - grain
- PennYW (1dwt=1,55517384g) jewellery mass unit,
- GrAM (1g) - gram.

The way of choosing carats as weighing unit is shown on the pictures on the left.

Attention:

In scale with LCD, sign "■" is replaced by designations of mass units: lb, kg, oz, ozt, ct.

13.5. Percentage calculation function (PErC)



The function allows displaying weighing result in percent.

Measurement is performed in two phases:

- first phase – weighing reference mass (mass referenced to 100%),
- second phase – weighing any sample mass as a percent of reference mass measured in first phase.

Weighing result is displayed in various formats, depending on reference mass value. For reference mass values between 0÷3,5% of scale capacity, format of weighing result is *100.0*, for values between 3,5÷35% it is *100.0* and above 35% - *100.00*.

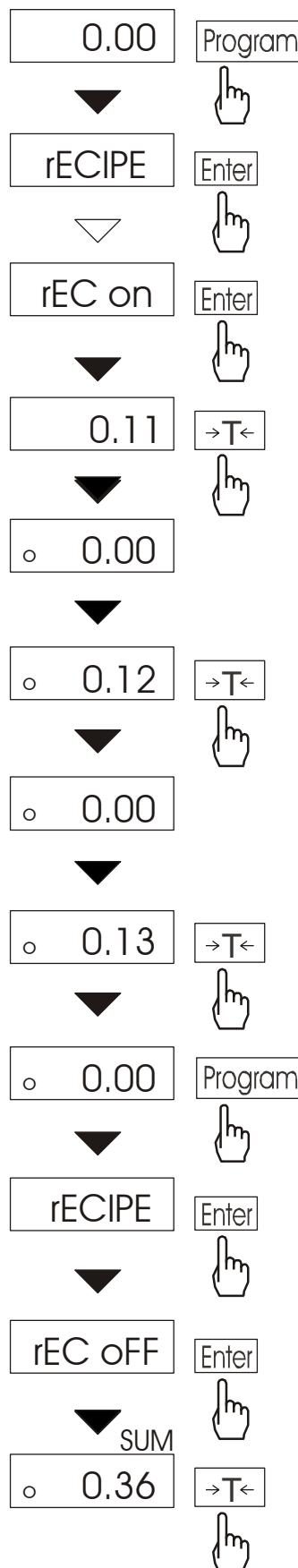
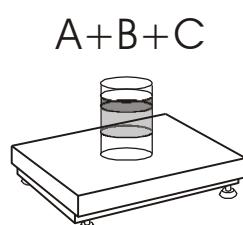
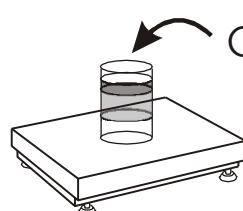
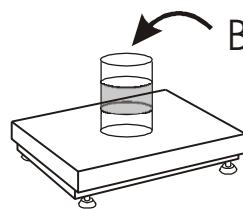
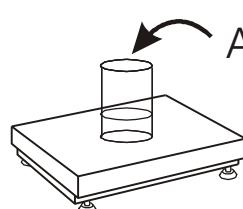
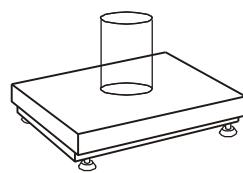
The function has the following options:

- *PEr oFF* – switch the function off,
- *PEr on* – set current indication as 100%, show indications in %,
- *out* – exit without changes.

Caution:

1. *PEr Err* message informs that reference mass is less than 0,5·Min or was not defined.

13.6. Function for summing recipe ingredients (*rECIPE*)



This function allows for separate weighing of several ingredients in one container with a possibility of control total weight of all weighed components.

The function has the following options:

- *rEC off* – leave the function with possibility of reading to read total weight,
- *rEC on* – start recipe weighing
- *rEC Con* – continue previous recipe.

When preparing a recipe successive ingredients (A, B, C, etc.) are weighed each time starting from zero indication. In order to allow this after weighing of each ingredient tare the scale.

After weighing of several ingredients reading total weight is possible (despite scale taring). In order to do that press *Program* key, select *rECIPE* function once more and use *rEC off* option.

Sign „SUM” signals total weight indication. Recipe is finished when $\rightarrow T \leftarrow$ key is pressed.

When „SUM” sign is displayed recipe continuing is possible. *rEC Con* option is used for that.

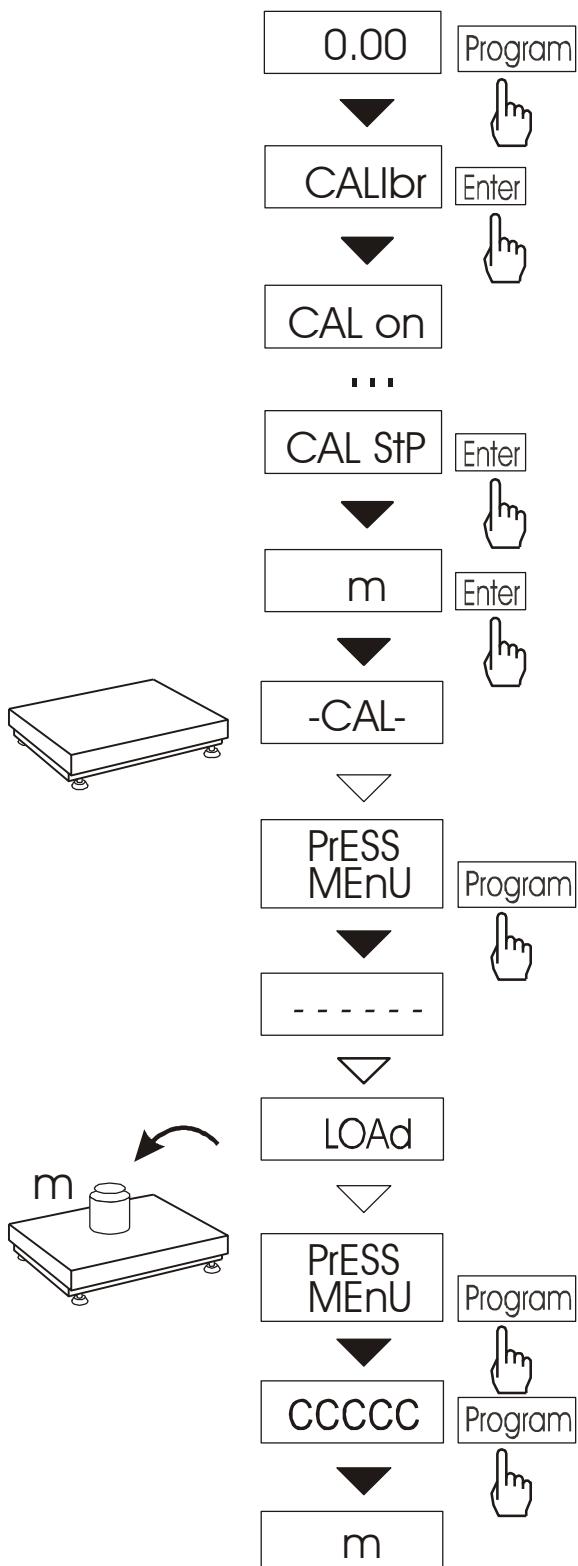
Note:

Sign „SUM” on the left side of display informs about *rECIPE* function activity.

13.7. Function for calibration with external weight (CALibr)

Calibration with external weight should be performed if scale accuracy is not satisfactory. Calibration weight stated in technical data table for the scale (or of better accuracy) should be used then.

Operations sequence:



Press *Program* key to display user functions, shown one by one in loop.

Press *Enter* key when *CALibr* function appears.

The following options will be displayed:

-*CAL on* – calibration with external recommended value weight (see technical data).

-*CAL StP* – calibration with external weight, confirmation of next steps - *MENU* key,
out – leave without changes

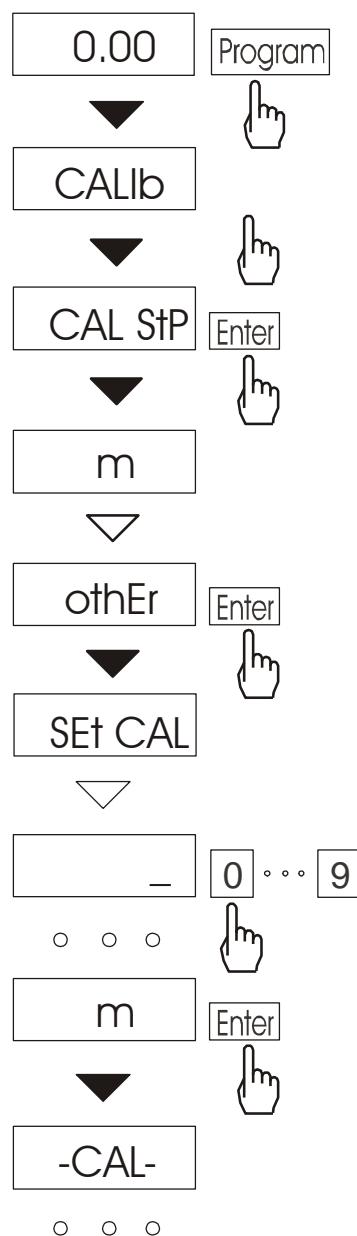
Press $\rightarrow T \leftarrow$ key when *CAL StP* option appears (calibration in two steps).

Press *Program* key and wait for writing zero to the scale.

When *LOAD* message appears put standard of mass on the pan. Press *Program* key (*CAL on* doesn't need pressing *Program* key).

Wait until internal calibration is finished and zero indication is displayed.

Sequence of actions during calibration with chosen value of standard of mass:



Press *Program* key to display user functions.

Press *Enter* key during displaying *CALib*.

Press *Enter* key during displaying *CAL StP*.

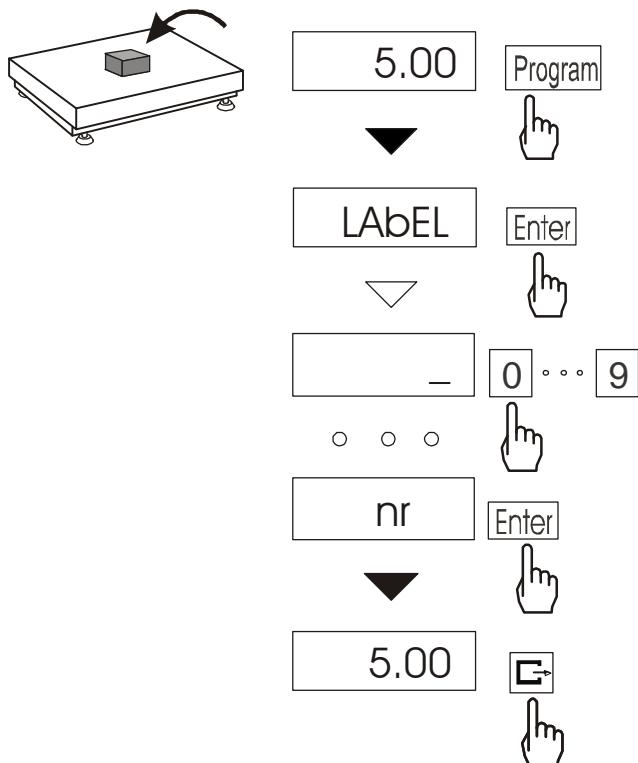
Following options will be displayed:
-Pt on – calibration with chosen mass value,
-Pt StP – calibration with chosen mass value with confirmation of successive steps using *Program* key,
out – out of calibration.

Press *Enter* key if the displayed vale is ok. If not Press *Enter* key during displaying *othEr*.

Further calibration process instructions are made analogically as mentioned on previous side.

13.8. Label choosing function (LAbEL)

This function is used in scale with *ELTRON (Port-1)* data protocol. This protocol enables label printout with actual scale indication and chosen data from *PrInt* special function (variable data), for example date and time. Other data, for example company address, product name, barcode can appear on label as a constant text. Label patterns with number (4 digit) used by user should be saved in scale memory according to printer manual. Label pattern choice is made by inscribing label number using *LAbEL* function.



Press *Program* button.

When *LAbEL* is displayed press *Enter* key.

Actual label number will show.

To enter new label number press *Enter* key, to exit function without number change press *Program*.

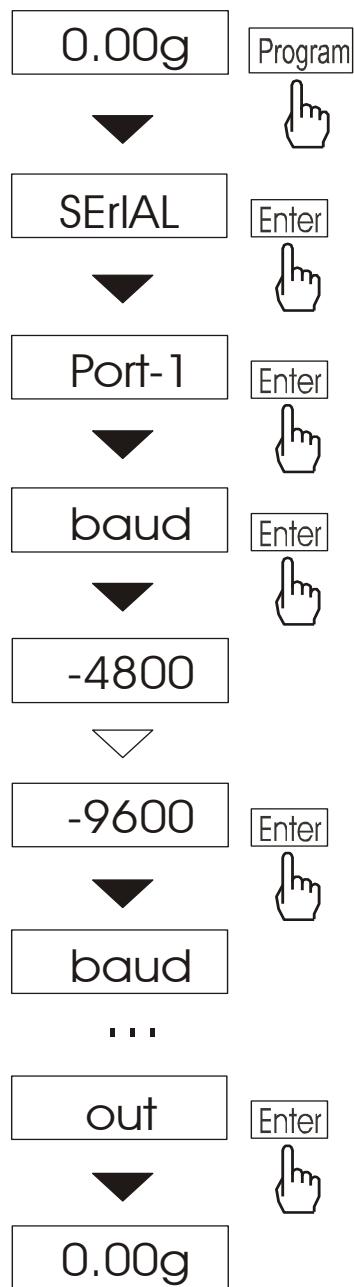
To inscribe label number use numerical keys and confirm using *Enter*.

After entering label number, putting load and pressing \rightarrow key will cause sending data to label printer.

Data format sent to label printer (label nr 1, language EPL-2):

US	(55 53 0D 0A)
FR"0001"	(46 52 22 30 30 30 31 22 0D 0A)
?	(3F 0D 0A)
00:00	(30 30 3A 30 30 0D 0A)
2000.00.00	(32 30 30 30 2E 30 30 2E 30 30 0D 0A)
10 g	(20 20 20 20 20 31 30 20 20 67 0D 0A)
P1	(50 31 0D 0A)

13.9. Function for setting serial interface parameter (SErIAL)



The function allows setting the following communication parameters of serial interface:

- transfer protocol (*Prot*):
LonG – printer, computer
Eltron – label printer
- baud rate (*bAud*): (4800, 9600, 19200, 38400, 57600bps),
- number of bits in single char. (*bitS*): 7, 8,
- parity control (*PArItY*):
none – no control
Odd – nonparity
Even – parity control,
- scale number in network (*nr*):
(if the scale doesn't work in network the number must be 0),
- result transmission kind through serial interface (*SendInG*):
 - stb* – transmission after $\text{G}\rightarrow$ key is used and result is stable,
 - transmission after $\text{G}\rightarrow$ key is pressed without need of stabilisation,
- automatic transmission after load is put on and result is stable (*Auto*),
- continuous transmission, about 10 results per second (*Cont.*)

Default parameter values:

Long, 9600 bps, 8 bits, none, stb

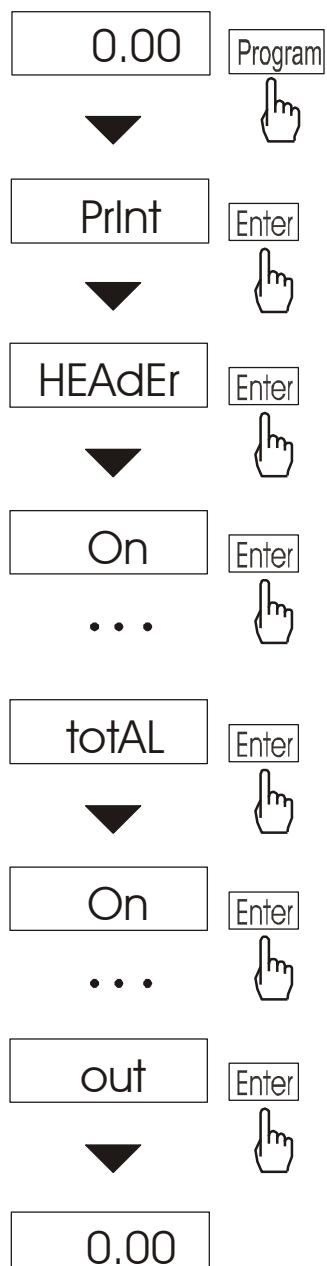
In order to set needed parameters choose *SErIAL* function, select appropriate parameter and press *Enter* key when required option or parameter value is displayed.

The way of setting baud rate of 9600 bps is shown as example in the pictures on the left, setting other parameters is performed similarly.

In scales with an additional serial port appear *Port-1* and *Port-2*, for the independent setting of both ports.

13.10. Printout configuration (PrInt)

Function is used for printing additional information stored in scale memory, weighed product identification data and scale operator inscribed using scale keys and scanner.



The function allows switch on/off the following positions on printout: *HEAdEr* – header: name, model and scale number,

- *Id OPER* – operator code (max 6 digits),
- *Prn no* – successive printout number (choose this option to zero counter),
- *Id Prod* – product number (13 digits),
- *Count* – counting result,
- *totAL* – result sum,
- *APW* – unitary mass,
- *netto* – net mass
- *tArE* – current tare value,
- *brutto* – gross mass
- *totAL* – total mass (*totAL* function)

If *Id Prod* or *Id OPER* is chosen, it is possible to inscribe quickly their new values (with omission of main menu).

In order to do that hold (about 3 seconds) *C* key and release it when *Id Prod* or *Id OPER* is displayed. Inscribe new value using numerical keys and confirm by using *Enter* key.

While inscribing *Id Prod* user can use scanner connected to RS232C interface.

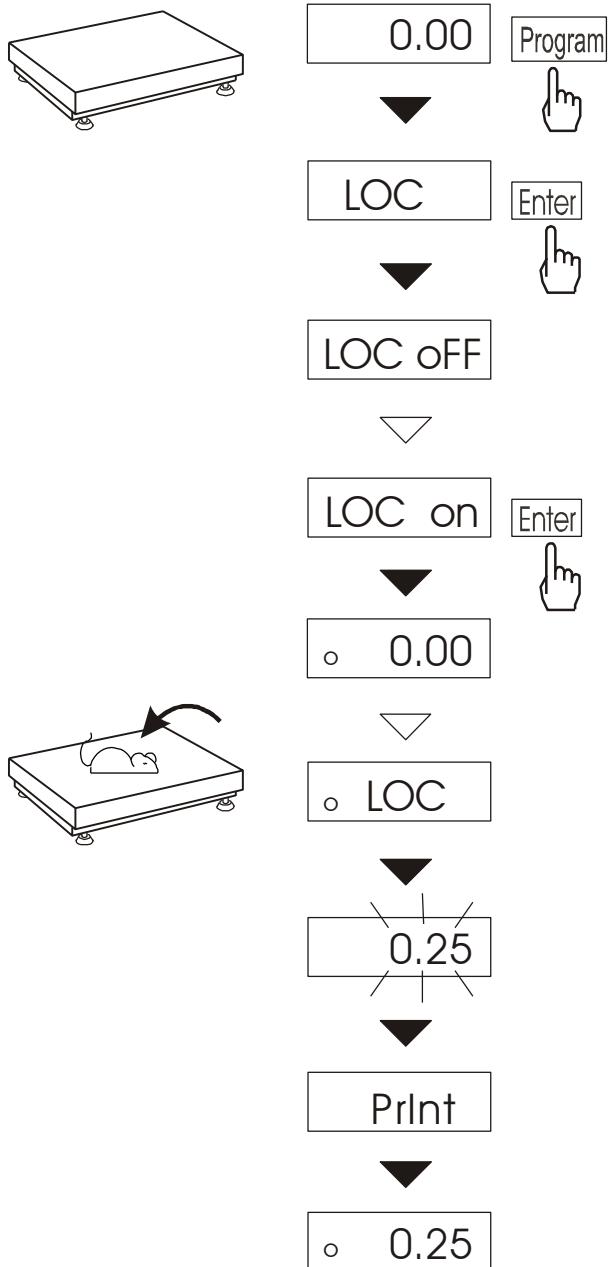
Sample printout during normal weighing (all printout positions activated):

BA30
MAX: 30kg e=d=0.01kg
S/N :

ID OPER. : 000001
DATE : 2012-11-08
TIME : 12:26
NO : 3
ID PROD. : 01
COUNT : 0 PCS
APW : 0.000 g
NET : 3.08 kg
TARE : 0.00 kg
GROSS : 3.08 kg
TOTAL : 0.00 kg

13.11. Animal weighting function (LOC)

The function allows weighing animal moving on the scale.



Press *Program* key.

When *LOC* function is displayed press $\rightarrow T\leftarrow$ key.

The following options appear on display successively:

- *LOC off* – leave the function,
- *LOC on* – automatic weighing after loading the scale,
- *LOC Prn* – the measurement initiated manually by pressing G^{\rightarrow} key.

When *LOC on* is displayed press $\rightarrow T\leftarrow$ key.

Tare the scale using $\rightarrow T\leftarrow$ key if necessary and place the animal on the pan.

Wait until the weighing result is averaged – scale display will be blinking. Then scale will show stable averaged result and will send it through serial port. Final result is displayed on the display and send via serial port to computer or printer.

The result remains on display for about 30 second.

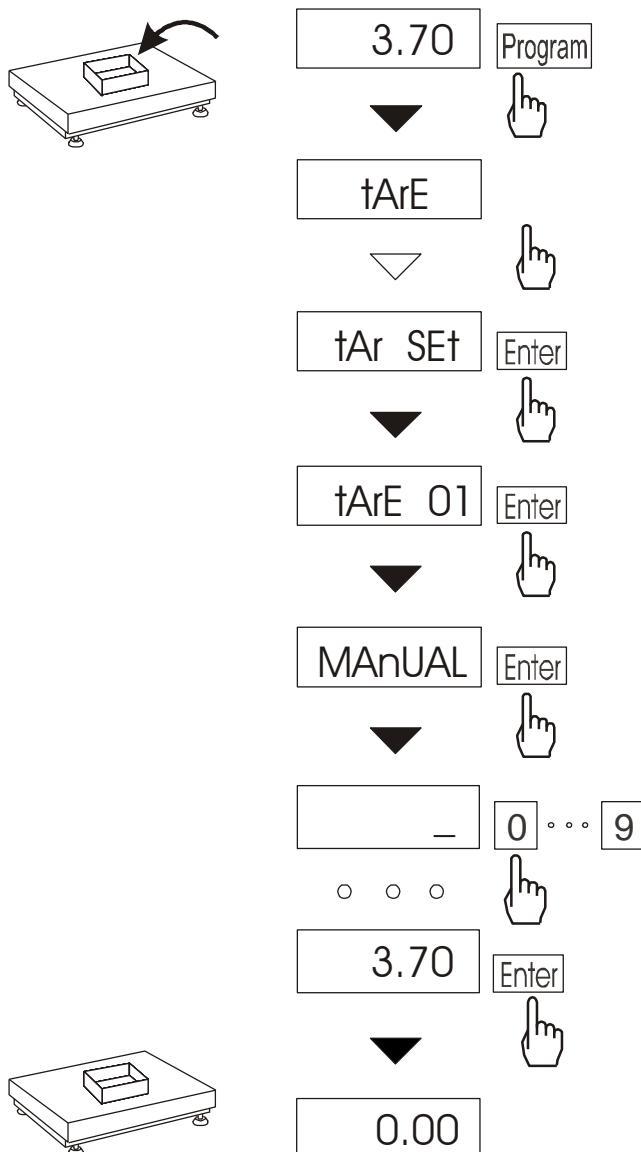
Important notes:

1. The loads less than Min are not averaged.
2. In the case when placing the animal takes more than 5s, it is advised to use *LOC Prn* (measurement initiated manually). It will allow performing measurement in right moment pressing G^{\rightarrow} key.

13.12. Memorizing tare function (tArE)

This function enables to measure gross weight of a sample placed in a container of a known weigh value (stored in the memory) and to display calculated net weight of the sample. Tare value is recalled from the memory with $\rightarrow 0 \leftarrow$ or $\rightarrow T \leftarrow$ key when the pan is empty. Tare value may be entered using the keypad or by sampling container weight from the pan.

Operation sequence:



The following options are possible:

- tAr OFF – leave the function,
- tAr on – activate the function with the previous tare value,
- tAr .. – sample tare value from the pan,
- tAr SET – enter tare value
- out – printout a setting value of tare.

Press *Enter* key during *tAr Set* displaying.

By pressing *Enter* key choose proper memory cell where tare will be stored: *tAr 01, 02, ..., 10*.

Choose inscribing method :

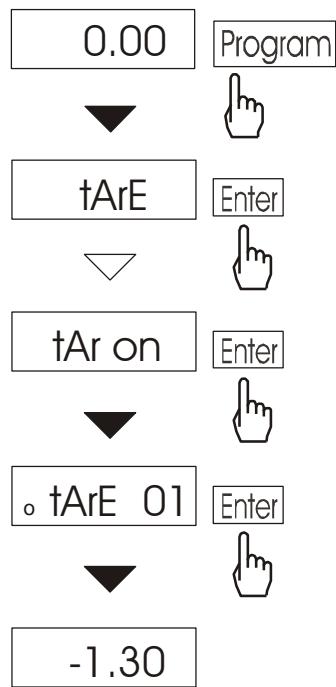
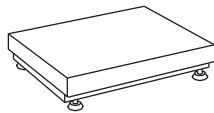
- *MAnUAL* – inscribing using numerical keys,
- *Pan* – inscribing mass value that is on the pan.

After storing tare, the scale starts working with inscribed tare value.

Note:

Tare value is stored in memory also after unplugging the scale from the mains

Weighing with constant tare:

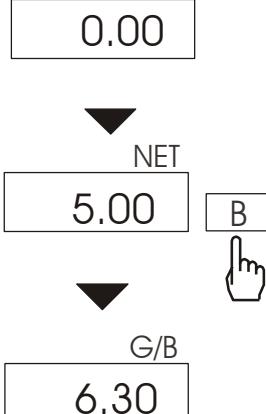
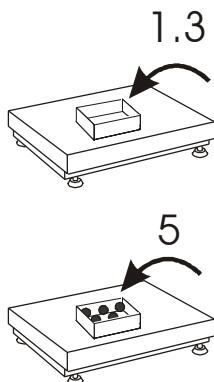


In order to use tare value that is located in memory, choose from menu *tArE* function and then *tAr on* option.

A list of memory cells will show up:
tAr 01, 02, ... , 10.

Cells with inscribed value are marked with "▲" sign.

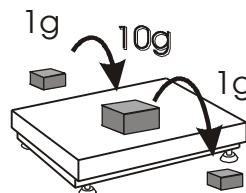
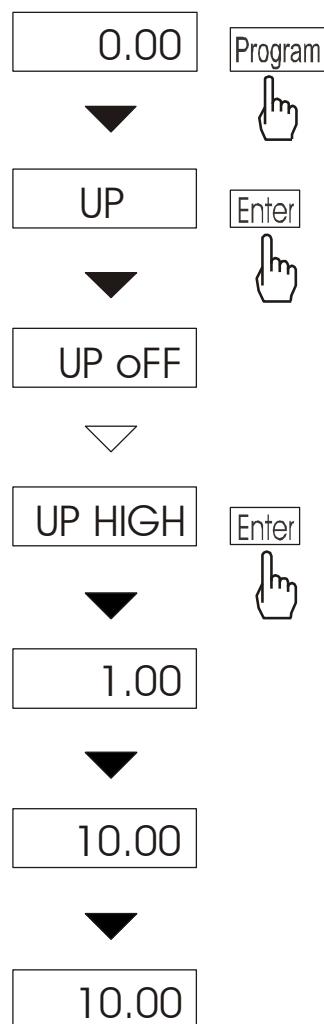
Choose proper memory cell using *Enter* key.



tArE function is activated with chosen tare value. Moreover the scale will indicate nett weight (weight on the pan minus tare values). Using $\rightarrow T \leftarrow$ key (or $\rightarrow O \leftarrow$, while empty pan) causes scale zeroing and then subtraction of recalled tare. Minus indication will show up

13.13. Maximum value indication function (UP)

This function allows holding maximum (or minimum) value indication shown by the scale at the moment.



Before measurement scale should be tared.

Function has following options:

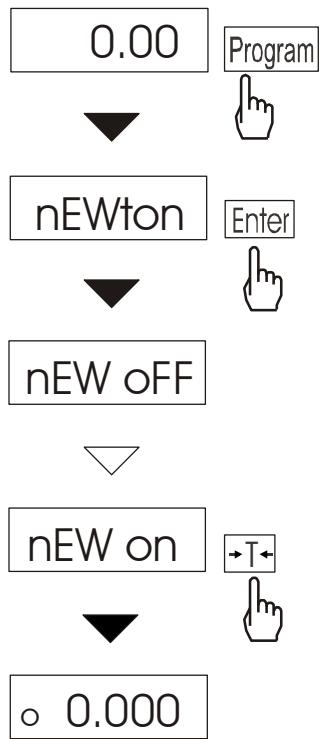
- *UP OFF* – function off,
- *HIGH* – holding maximum value,
- *LOW* – holding minimum value.

Pressing $\rightarrow T \leftarrow$ key will cause result zeroing.

Note:

Autozeroing function and the stabilisation indicator are deactivated when *UP* function is running. Weighing result is continuously averaged from 5 measurements.

13.14. Force measuring function (*nEWton*)



Function activation causes displaying result in force units (N).

Press *Program* key:

-*nEW off* – function off,
 -*nEW on* – force measurement in N,
 -*ArM* – torque measurement in Nm
 (after choosing this option actual force arm is displayed; new value can be inscribed using numerical keys and confirm using *Enter*).

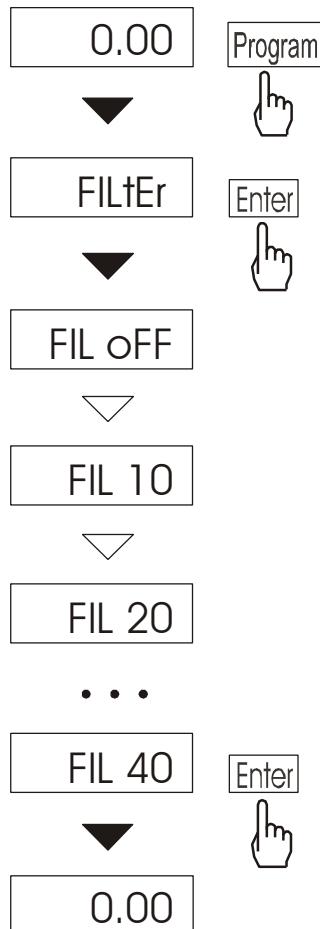
Using *Enter* key choose *NEWton* function, and then *nEW on*.

Attention:

Units converting from mass (kg) to force (N) is made for acceleration of gravity ($g=9,80665\text{m/s}^2$):

Note: $1\text{N} \approx 0,1019\text{kg}$

13.15. Anty-disturbance filter option (*FILtEr*)



This function allows using digital filter with selected intensivity during weighing. Filter reduces the influence of mechanical vibrations (air blasts, base vibrations) on measurement result.

Press *Program* key and select *FILtEr* by pressing *Enter* key.

The following options will be shown successively on display:

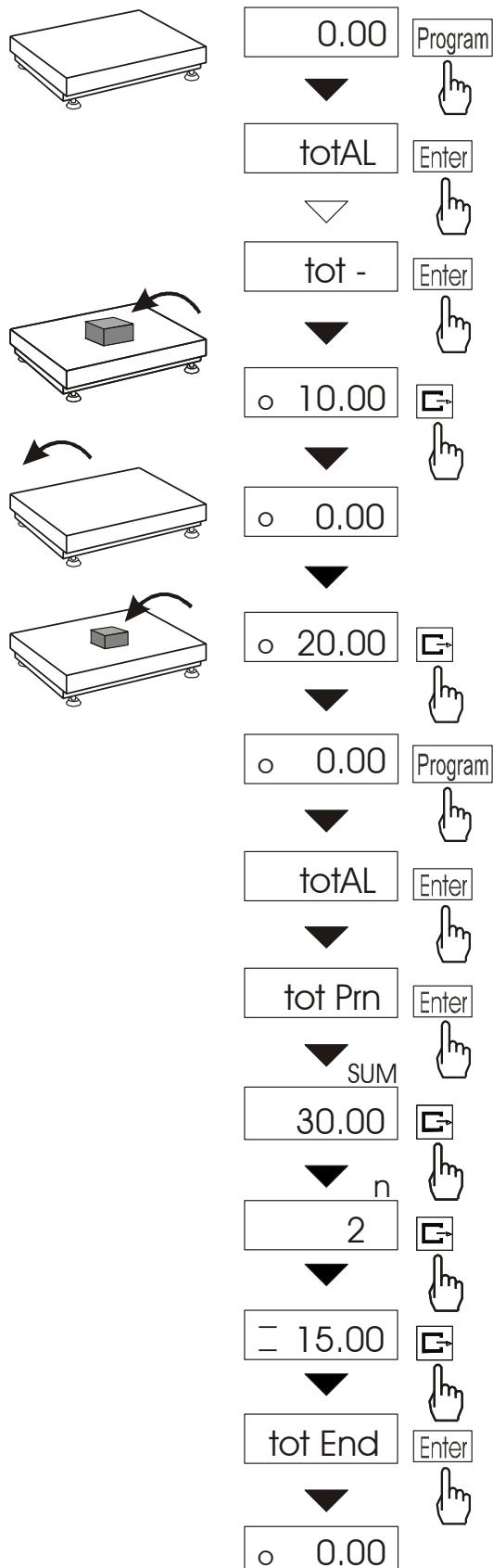
- *FIL oFF* – work without filter,
- *FIL 10* - filter I (weak),
- *FIL 20* - filter II (medium),
- *FIL 30* - filter III (sharp),
- *FIL 40* - filter IV (very sharp).

Select on of four filters. This will cause starting weighing with selected filter.

In order to return to normal scale work use *MENU* key and choose *FIL oFF*.

13.16 Total weight function (totAL)

The function allows calculating total weight for series of measurements, which can be greater than scale capacity. It allows calculating total weight as well as average value.



Press **Program** key.

When **totAL** is displayed press $\rightarrow T \leftarrow$ key.

The following options will appear successively:

- **tot Prn** - report printout without clearing total register,
- **tot OFF** - clearing total register, report printout and leaving the function,
- **tot \square** - working with receipt printout after each measurement,
- **tot** - working without receipt printout.

Press $\rightarrow T \leftarrow$ key when **tot \square** is displayed. Perform measurement series by pressing \square key for storing results into total register.

In order to print and display results enter the function by choosing **total** and **tot Prn** option from menu.

The results are display in the following sequence:

- total weight (\equiv)
- number of registered measurements (n),
- average value ($=$),

regarding that moving to display successive result is performed after pressing \square key.

In order to go back to total weighing without zeroing total register press \square key third time.

To leave the function with clearing total register, select *totAL* function from menu and choose *tot oFF* option. When It will cause the scale prints the communicate informing about clearing registers.

The form of receipt after each measurement:

Date: ...	Time. ...
measurement no	weight
measurement no	weight

Report form:

Date: ...	Time. ...
TOTAL WEIGHT =	
NUMBER OF SAMPLES =	
AVERAGE VALUE =	

Note:

When the scale doesn't have an internal clock, Date and Time do not appear on printout.

Maximum number of measurements is 99 999.

Maximum total load 99 999 000d.

The weighing unit of the total value from the register (Total) is the same as the weighing unit stated on the keypad or is 1000 times greater, what is signalled by "o" indicator at the left of the display.

If the registered value is too big to be displayed, "E" communicate appears on the display. If the number of series is too high and cannot be displayed, "Err1" communicate appears on the display.

13.17 Checkweighing function (thr)

This function allows comparing weighing result with two programmed reference values: lower and upper threshold. Comparison result is signalled with indicators (MIN, OK, MAX) and sound signal generated when threshold values are exceeded. If comparison result is:

- smaller than lower threshold – the scale signals MIN (yellow colour),
- between threshold values - the scale signals OK (green colour, with the short sound signal),
- greater than upper threshold - the scale signals MAX (red colour, long sound signal).

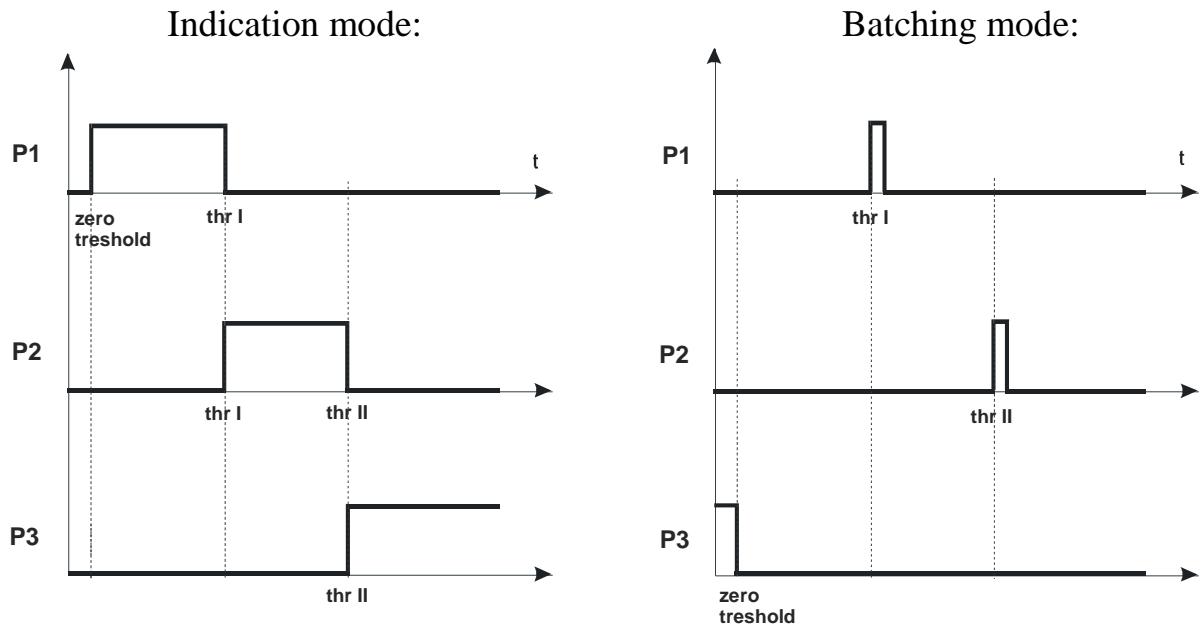
The checkweighing results can be used to control:

- optical indicator (*Indication mode*),
- batching devices (*Batching mode*).

Standard scale is set for cooperation with optical indicator.

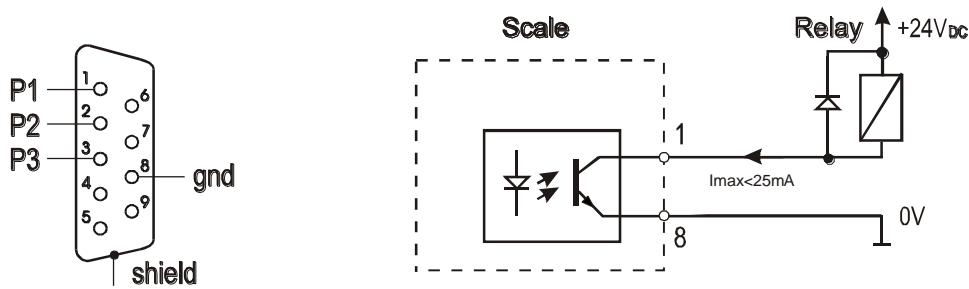
On outputs P1-P3 (*Relays socket*) short-circuit states appear as result of comparison scale indication with threshold values.

On the chart below output states are shown during increasing load on the scale for both working modes:



In *Batching* mode on P1 (thr I) and P2 (thr II) outputs short-circuit impulses appear for time of 0,5s. On P3 (zero) output short-circuit state appears when indication does not exceed threshold value signalling zero load.

Relays connection diagram:



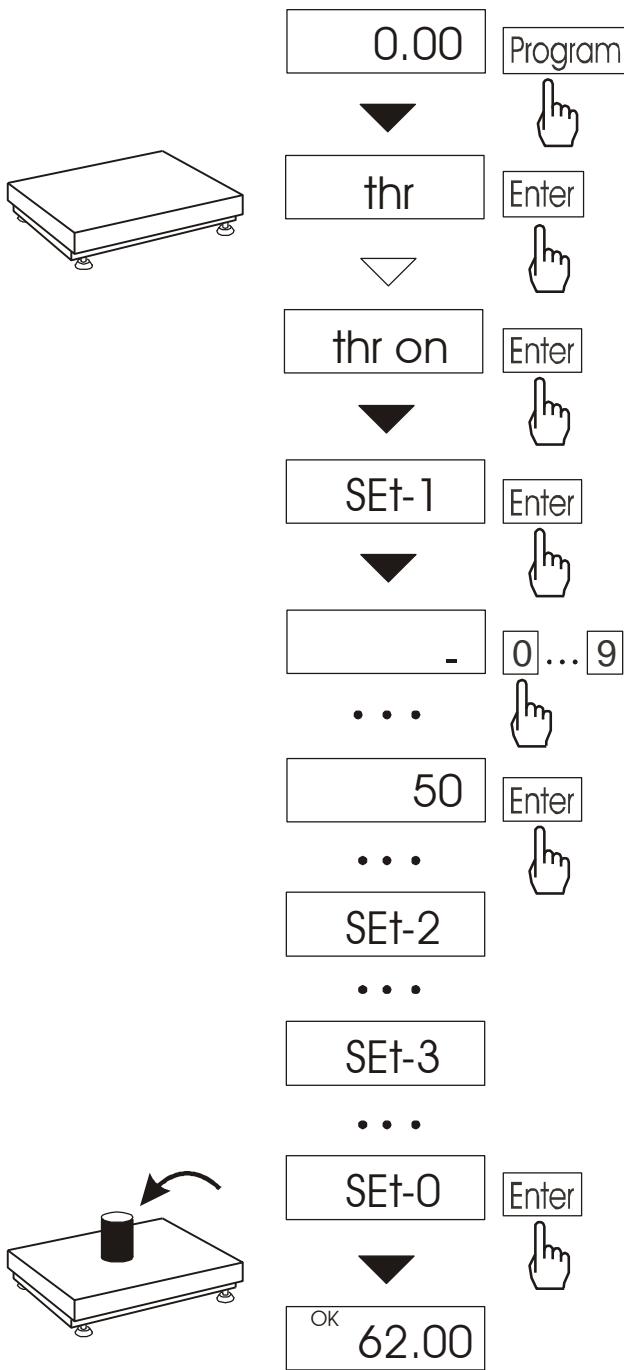
Relays output is the open collector transistor output with load capacity 25mA / 24V. Transmitter inputs must be protected with diodes, e.g. 1N4148.

It is advised to use MS3K/P electronic board (sold separately), consisting of RM96P transmitters, with DC24V input voltage and AC250V, 3A output.

Important notes:

1. After switching the scale on, both thresholds are set to maximum values.
2. When setting upper threshold value, pay attention that its value is not below lower threshold value.
3. Setting lower and upper threshold value is possible after sending appropriate orders from computer, what is described in scale user manual.

Operation sequence:



Press *MENU* key and choose *thr* pressing $\rightarrow T \leftarrow$ key.

The following options are displayed successively:

- *thr oFF* – deactivate the function,
- *thr on* – activate the function,
- *thr Prn* – check last threshold values (press *E* key several times),
- *thr CFG* – choose *Relays* socket mode:
 - out* – exit to weighing
 - IMPULS* – *Batching* mode
 - SIGNAL* – *Indication* mode.

Choose *thr-on* option using *Enter* key. The following options for entering thresholds are displayed:

- *SEt-0* - go to weighing with signalling threshold excess,
- *SEt-1* - set lower threshold value,
- *SEt-2* - set upper threshold value,
- *SEt-3* - set zero signalisation threshold.

Using *Enter* key select *SEt-1* option.

Set lower threshold value using numerical keys and confirm using *Enter*.

Then select *SEt-2* and *SEt-3* option.

Choosing *SEt-0* option will cause starting work with signalisation of exceeding thresholds and zero.

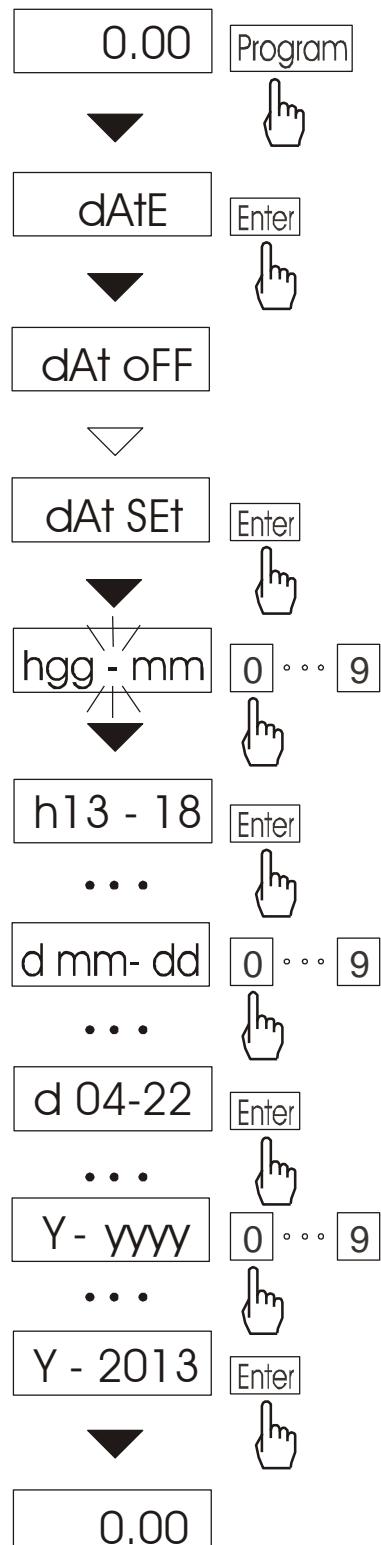
To change *Relays* socket mode use *thr CFG* option. Default option is *SIGNAL*.

To leave the function, press *Program* key and then choose *thr* and *thr oFF* options.

Attention:

Quick function leaving by pressing *Clr* key. Quick function start – *Start* key.

13.18 Function for setting date and time (dAtE)



The function allows setting current date and time of scale internal clock and mode of its use.

The function has the following options:

- *dAt oFF* – deactivate date and time during printout of current weighing result,

- *dAt on* – activate date and time during printout of current indication (⬅ key),
- *dAt SET* - change current date and time,

- *dAt PIN* – data and time secure password (to prevent from changing date and time by unauthorized personnel),

- *dAt For* – data printout in *USA* or *EU* format,

- *tM For* – time printout in *24h* or *12h* format.

The example at the left presents how to set current date and time using *dAt SET* option.

After setting proper date and time it should be activated with *dAt on* option.

Date and time format:

UE: rrrr-mm-dd gg:mm

USA: mm-dd-rrrr gg:mm AM/PM

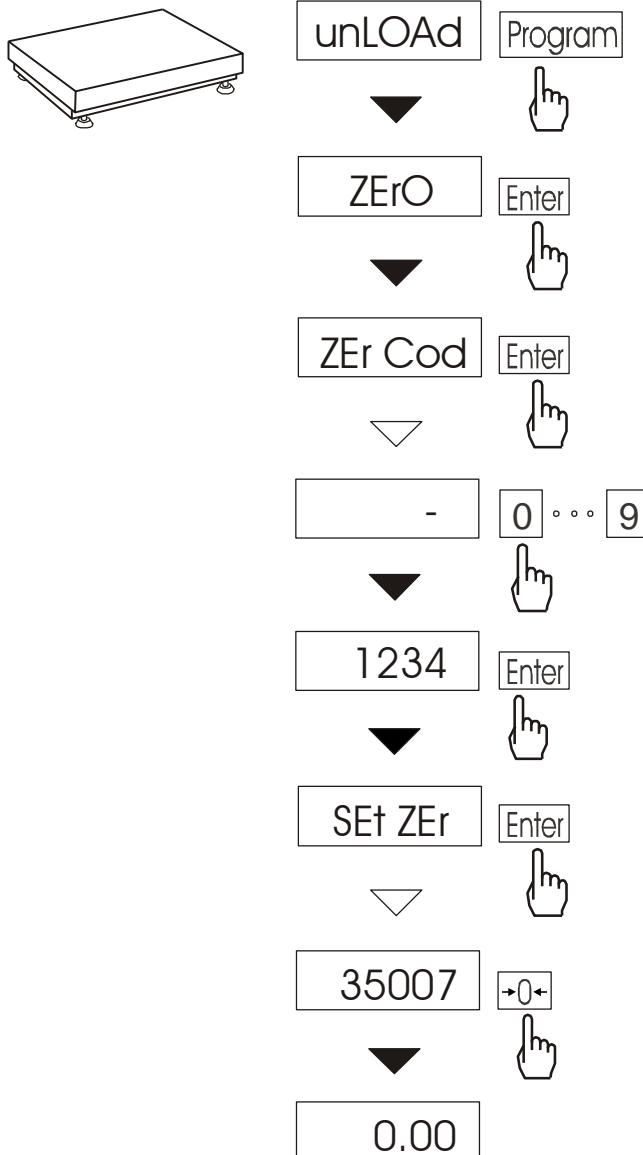
(gg – hours, mm – minutes, AM – before noon, PM – after noon, mm – month, dd - day, rrrr - year).

Attention: Inscribing non-zero *PIN* value causes showing *PIN* sign during next date and time changing and inscribing 4 digit code is necessary. (using key →0←).

13.19 Entering reference zero function (ZErO)

Note: This function is enabled in non legalized scales only.

ZErO function allows entering new value of reference zero (value referred to empty pan) without need of contacting with authorised service centre.



Press *Program* key.

When *ZErO* is displayed press $\rightarrow T \leftarrow$ key.

On the display a sign *ZEr Cod* will show up momentary and the a dash on last digit position.

To enter code (in new scale: 1234) use numerical keys and confirm using *Enter*.

The following options appear successively on display:

ZEr Cod – enter new secure code value,

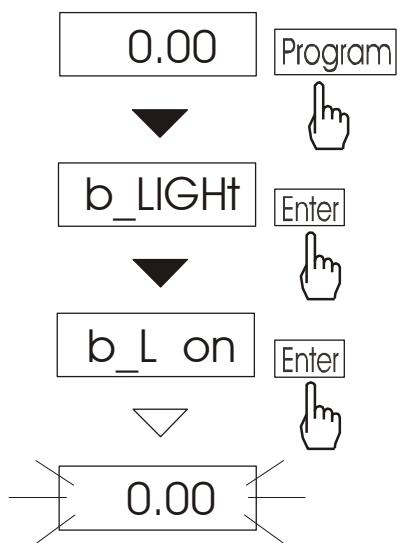
ZEr SET – enter new zero value

Using $\rightarrow T \leftarrow$ key, choose *ZEr Set*. Direct result from A/C converter will appear on scale display.

When the pan is empty press $\rightarrow 0 \leftarrow$ key. Wait for finishing zeroing process.

In order to change access code use *ZEr Cod* option (as mentioned earlier).

13.20 Setting backlight function (*b_LIGHT*)



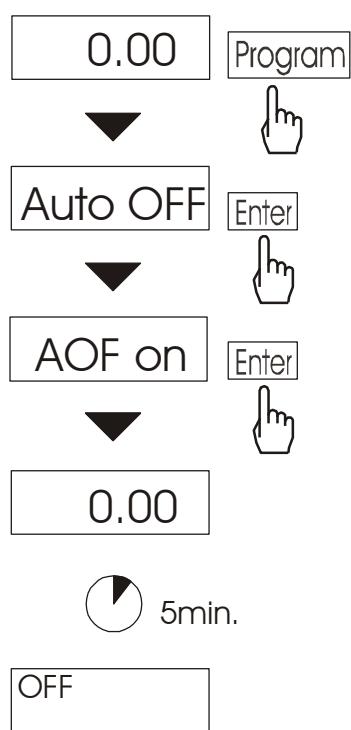
The function is used for choosing the work mode of scale display backlight:

- *b_L OFF* – switch backlight off,
- *b_L on* – switch backlight permanently on,
- *b_L ECO* – switch off after 30 seconds of inactivity (no load changes and no key operation),
- *b_L bAt* – like above, but when powering from accumulators only,
- *out* – out without changes.

Switching backlight off causes decrease of energy consumption by the scale, what is important during powering from accumulators.

13.21 Automatic switching off the scale function (Auto OFF)

The function is helpful in scales supplied from accumulator. The function causes scale to switch off automatically.



Press *Program* key.

When *AutoOFF* is displayed press $\rightarrow T \leftarrow$ key.

The following options appear successively on display:

AOF off – deactivate function,
AOF on – activate function- scale turns off after 5 minutes of not making any actions,

AOF bAt – as above but only when supplied from accumulators.

Out – out without changes.

13.22 Statistical calculations function (StAt)

Attention: Function available on demand. It replaces other special functions.

This function evaluates from series of measurements (max 1000) statistical parameters of weighting process.

Adding successively measurements to register is automatic and it occur after the scale is loaded and its indications stabilize.

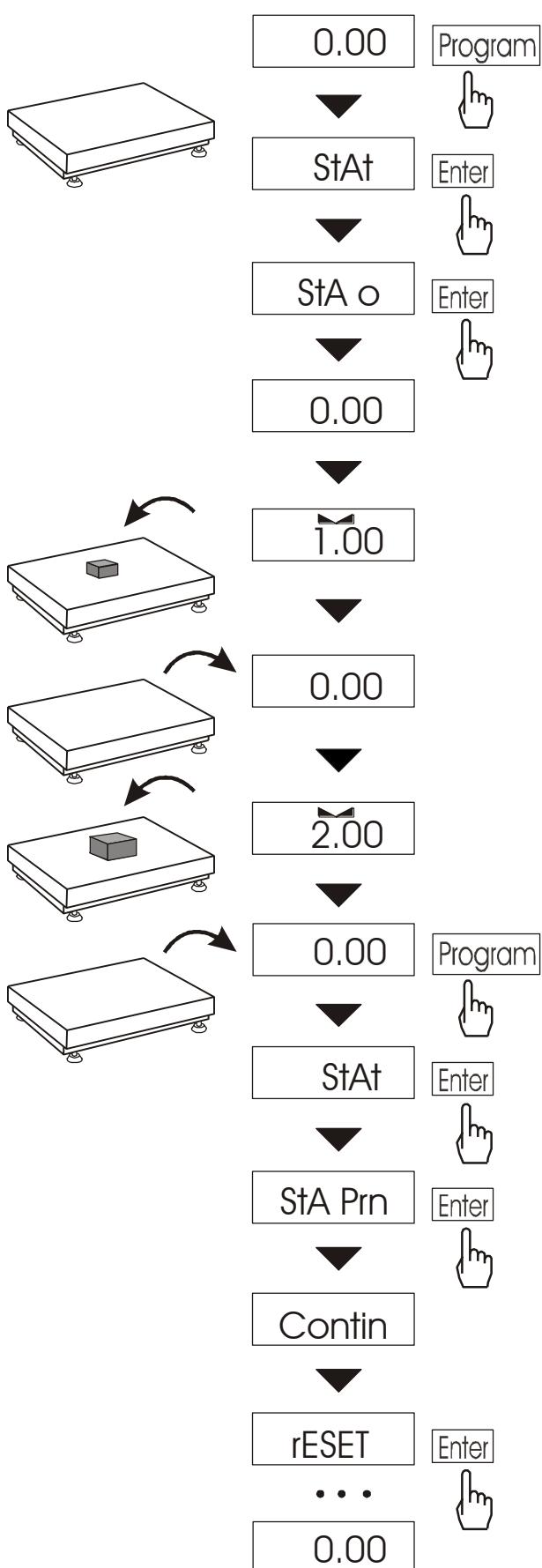
After each loading printout is made with: number of measurements, result, date and time (if clock is installed and the function is activated).

For the obtained measurements series the scale evaluates:

- n	-number of samples
- sum x	-sum of all samples $sum_x = \sum x_n$
- \bar{x}	-average value (sum x)/n
- min	-minimal value from n samples
- max	-maximal value from n samples
- max-min	-maximal value minus minima value
- S	-standard deviation $S = \sqrt{\frac{1}{(n-1)} \sum_n (x_n - \bar{x})^2}$
- srel	-variance factor $srel = \frac{S}{\bar{x}}$

Statistical calculations results can be printed.

Order of operations:



Press *Program* key.

When *StAt* is displayed press *Enter* key.

The following options are displayed:

- *StA Prn* – monitoring and printout of statistical data,
- *StA OFF* – deactivate function,
- *StA o* – activate function, work with printout of chosen weighting results,
- *StA -* – activate function, work without printout,
- *StA n* – maximal samples value,
- *Sta nM* – inscribing nominal value for statistics,
- *Sta tOL* – inscribing tolerance in %,
- *Sta tAr* – automatic tare on/off
- *StA CFG* – function configuration:
 - Auto* – Automatic work (samples are confirmed after loading the scale and indication stabilization.),
 - ManuAL* – manual work (confirmation is made by pressing *Enter* key).
- *out* – exit from function.

Remember first to inscribe nominal weight value and tolerance (mentioned above).

After that, push $\rightarrow T \leftarrow$ key when *StA o* is displayed.

Put on successively objects on the pan (remove after indication stabilization) in order to add them to measurements register.

In order to obtain printed statistical results from measurements series press *MENU* key and $\rightarrow T \leftarrow$ key when *StAt* is displayed and later *StA Prn*.

After printout two options are enabled:

- *rESET* – erasing results,
- *Contin* – continuation.

Pressing **ESC** key printouts estimated values and histogram :

Nominal - nominal value,

Tolerance - accepted value in percentage,

N - number of samples

IN TOL. – number of samples in tolerance

-TOL – amount of measurements
under allowable lower value

+TOL – amount of measurements above
allowable upper value

TOTAL - sum of weights of all n samples

AVERAGE – average weight as (Total)/n

MIN – minimum weight in n samples

MAX – maximum weight in n samples

ST. DEV. – standard deviation

ST. DEV.% – standard deviation percentage

To finish work with this function and
zeroing result register press *Program*
key and then when *StAt.* and *Sta oFF* is
displayed press *Enter* button.

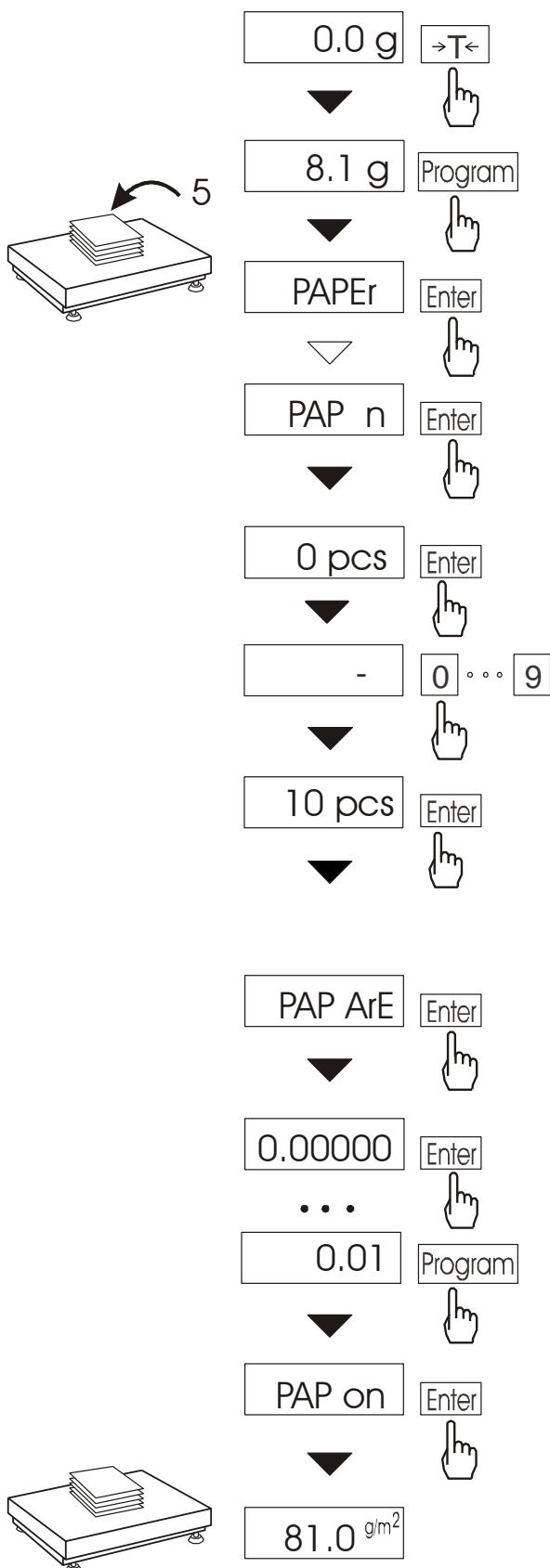
Statistics function cooperation with computer and printer

Scale can be equipped with two serial ports marked as RS232C-I (computer) and RS232C-II (printer). After each data printout by printer identical set of data is sent to computer. After sending by computer initialization signal S A CR LF (53h 49h 0Dh 0Ah) the scale sends to computer statistic data enclosed in histogram.

STATISTICS					
NOMINAL	:	50.000 g			
TOLERANCE	:	100 %			
MAX. N	:	500			
NO.	SAMPLE	TOL-	NOM	TOL+	
1	10.007 g	:	*	:	
2	20.125 g	:	*	:	
3	20.126 g	:	*	:	
4	30.205 g	:	*	:	
5	30.284 g	:	*	:	
6	30.201 g	:	*	:	
7	40.557 g	:	*	:	
		...			
N	:	25			
IN TOL.	:	25			
< TOL-	:	0			
> TOL+	:	0			
TOTAL	:	1264.664 g			
AVERAGE	:	50.587 g			
MAX	:	91.131 g			
MIN	:	10.007 g			
MAX-MIN	:	81.124 g			
ST. DEV.	:	20.6480 g			
ST.DEV. %	:	40.82 %			
HISTOGRAM					
<TOL-	0	■			
	0	■			
	1	■			
	2	■			
	3	■			
	4	■			
	5	■			
	4	■			
	3	■			
	2	■			
	0	■			
	1	■			
>TOL+	0	■			

13.23 Paperweight calculation (PAPER)

This function enables to calculate paperweight of 1m² of paper basing on samples of known area. For quick access, the function is accessible directly by pressing *Program* key.



The balance must be tared just before the measurement.

Place the specific sample quantity of the same area (possible values: 1, 2, 5, 10, 20, 50, 100).

Press *Program* key to access Function Menu. To enter the function press *Enter* key when *PAPER* is displayed.

Press *Enter* key when *PAP n* is displayed.

Enter number of samples using numerical keys and confirm using *Enter*.

Press →T← key when *PAP ArE* is displayed. Enter area of a single sample (as above).

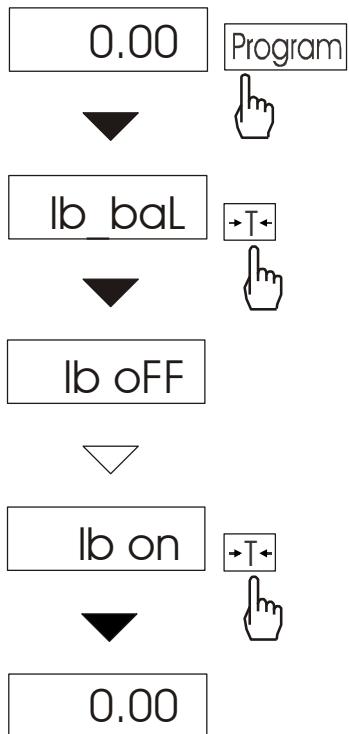
The result of paperweight measurement is finished with “=” mark pointing g/m² unit.

In order to finish work with function press *MENU* and then using →T← key choose *PAPER* and *PAP oFF*

Note:

1. “PAP Err” communicate marks that wrong values were inscribed in *PAP n* or *PAP ArE*.

13.24 Main mass unit change function (*lb_bAL*) – option



lb_bAL function is available only in scales assigned for foreign buyers, from countries where English pound is used. *lb_bAL* function enables choosing measurement main unit, used for current indications and used by other special functions like *tArE* function.

Option functions:

- *lb on* - lb (English pound),
- *lb OFF* – kg or g (dependent on scale type).

Attention:

In scales with *lb_bAL* function, the list of available units in *Unit* function changes. (lack of English pound and milligram).

14. Troubleshooting and maintenance

1. Scale should be kept clean and protected from dust, aggressive pollen and liquid.
2. Take care that no dirt is between pan and casing of the scale. If dirt is noticed take the pan off (lift it up). Clean dirt and then put the pan on.
3. In case of improper operation caused by a short-lasting lack of power supply, switch the scale off by unplugging it from the mains, and then after several seconds switch it on.
4. „SErvic(e)” message displayed after turning on unbiased scale means scale sensor mechanical damage.
5. Every repairs performed by unauthorized persons are forbidden.
6. To repair the scale, please contact nearest service centre. The list of authorised service centres is given in guarantee card and on www.axis.pl website.

Failure messages:

Message	Possible cause	Recommendation
<i>C-1 ... 6 (more than 1min.)</i>	negative result in one of the autotests	contact service centre
<i>unLOAD / SErvic(e)</i>	Scale loaded while switching on	Take the load off the pan
	mechanical damage of scale sensor	contact service centre
<i>L</i>	no pan on the scale	put the pan on
	mechanical damage of the scale	contact service centre
<i>H</i>	overweight of the scale	take a load off the pan
	mechanical damage of the scale	contact service centre
<i>indicator does not work</i> <i>---</i>	unstable scale position, ground vibration, air flows	locate the scale in place where stable results are maintained
	damage of the scale	contact service centre
<i>-----</i>	taring not finished	contact service centre
<i>- - -</i>	Taring not achieved (to small load or B/G use)	Scale zeroing or once again press B/G
<i>- - -</i>	Zeroing with too big load	Scale tare